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(12) **United States Patent**
**Sato**

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(54) **IMAGE FORMING DEVICE**

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(30) **Foreign Application Priority Data**

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(51) **Int. Cl.**
***G03G 21/18*** (2006.01)
*G03G 21/16* (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ..... ***G03G 21/18*** (2013.01); ***G03G 21/169*** (2013.01); ***G03G 21/1633*** (2013.01); ***G03G 21/1642*** (2013.01); ***G03G 21/1666*** (2013.01); ***G03G 21/1676*** (2013.01); ***G03G 21/1695*** (2013.01); ***G03G 21/1853*** (2013.01); *G03G 15/00* (2013.01); *G03G 21/00* (2013.01); *G03G 21/16* (2013.01); *G03G 2221/1654* (2013.01); *G03G 2221/1657* (2013.01); *G03G 2221/1684* (2013.01); *G03G 2221/183* (2013.01);
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(58) **Field of Classification Search**
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USPC ..... 399/111
See application file for complete search history.

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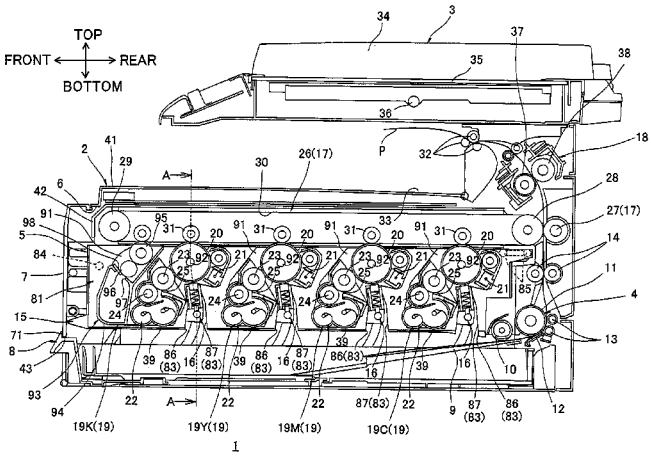
(57) **ABSTRACT**

In an image forming device, a retaining member is configured to retain a plurality of cartridges juxtaposedly arrayed in a prescribed direction. The retaining member is configured to move in the prescribed direction between a mounted position in which the retaining member is mounted in the main casing and a pulled-out position in which the retaining member is pulled out of the main casing. A belt is disposed above a plurality of photosensitive drums corresponding to the plurality of cartridges when the retaining member is in the mounted position. A tray is disposed below the retaining member when the retaining member is in the mounted position. A pickup roller configured to pick up a medium accommodated in the tray, a part of the pickup roller being arranged to overlap with a part of the retaining member in the prescribed direction when the retaining member is in the mounted position.

**16 Claims, 13 Drawing Sheets**



(51) **Int. Cl.**
*G03G 21/00* (2006.01)
*G03G 15/00* (2006.01)

(52) **U.S. Cl.**
CPC ..... *G03G2221/1869* (2013.01); *G03G 2221/1884* (2013.01)

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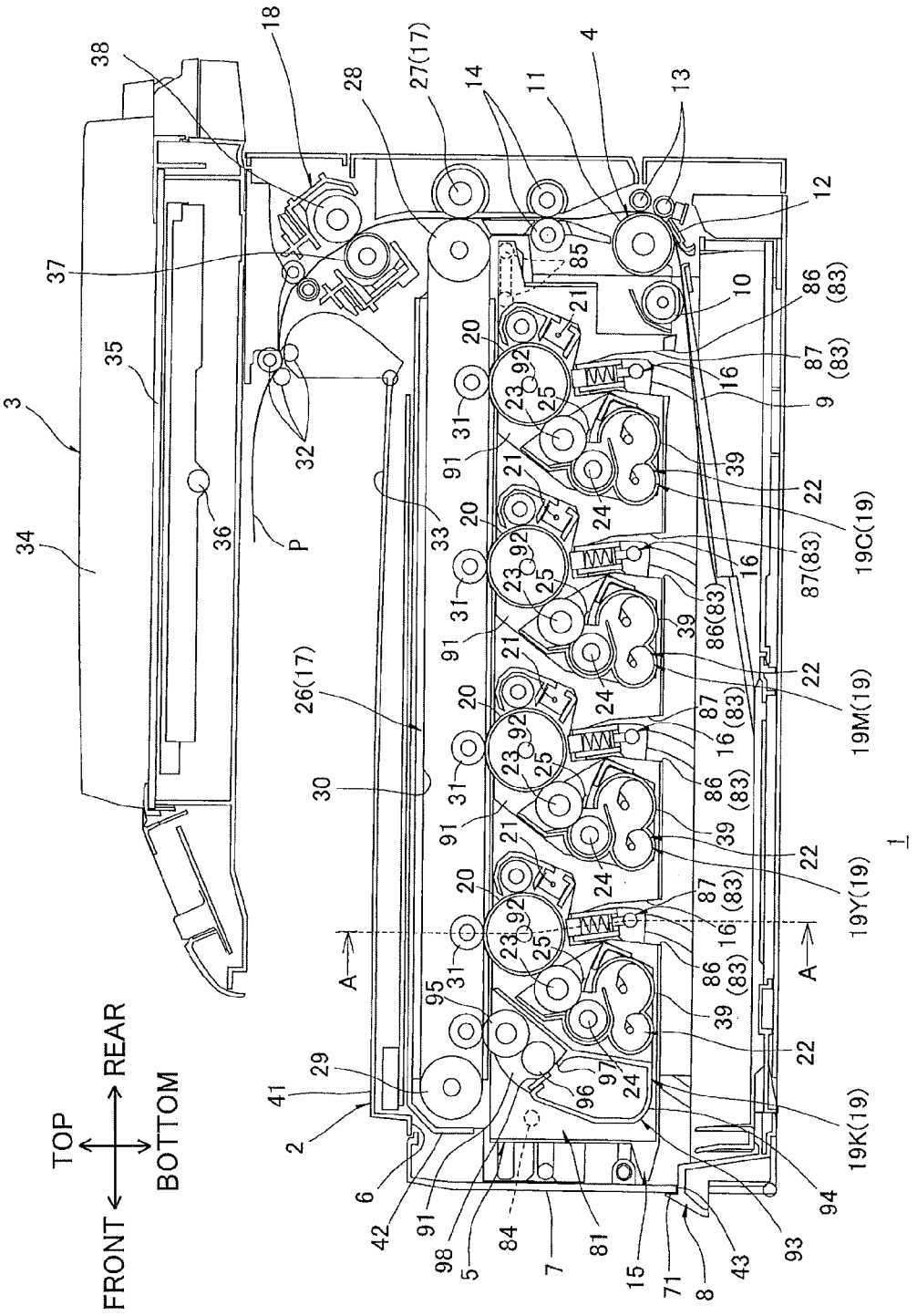
FIG.1



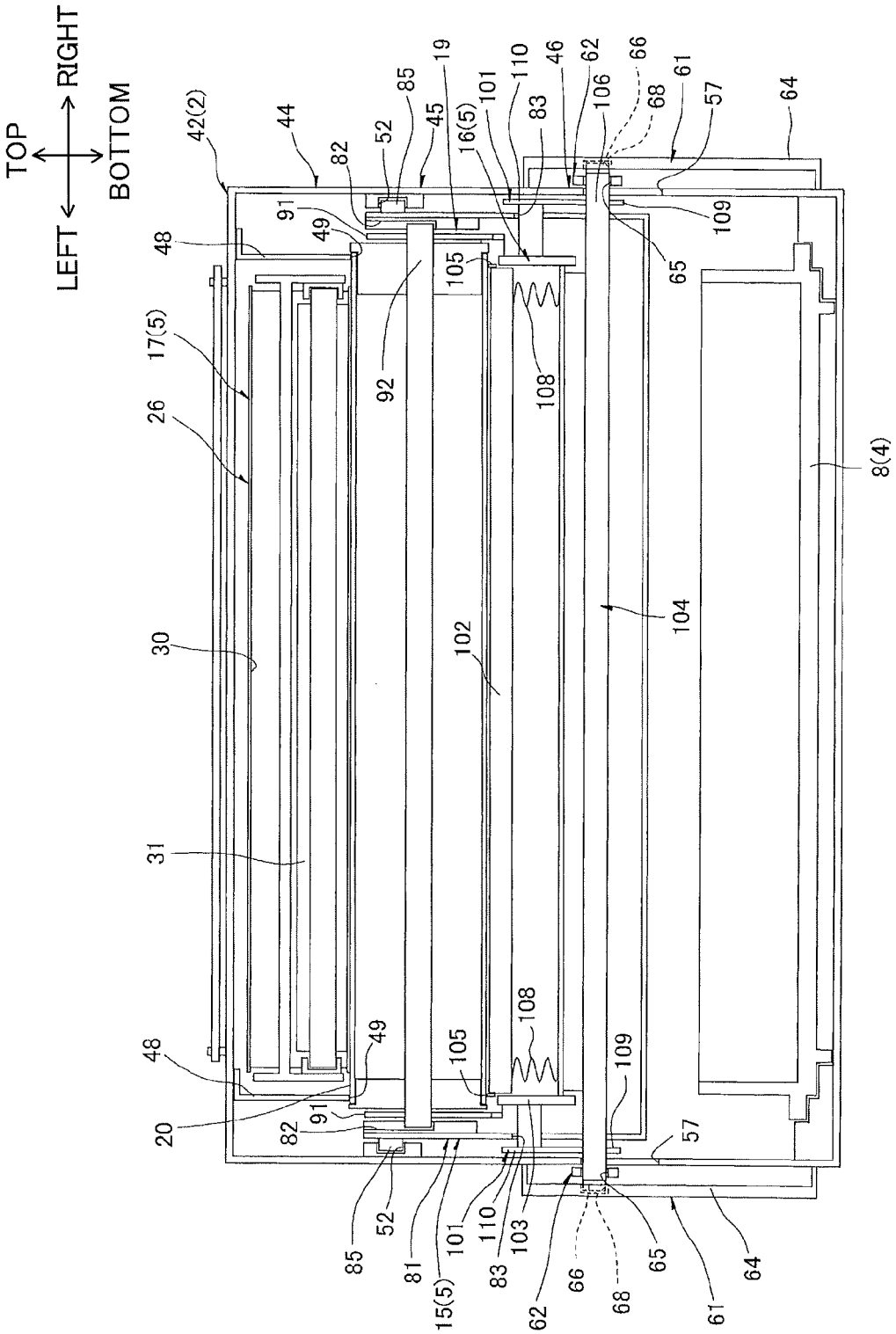

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FIG.2

FIG.3

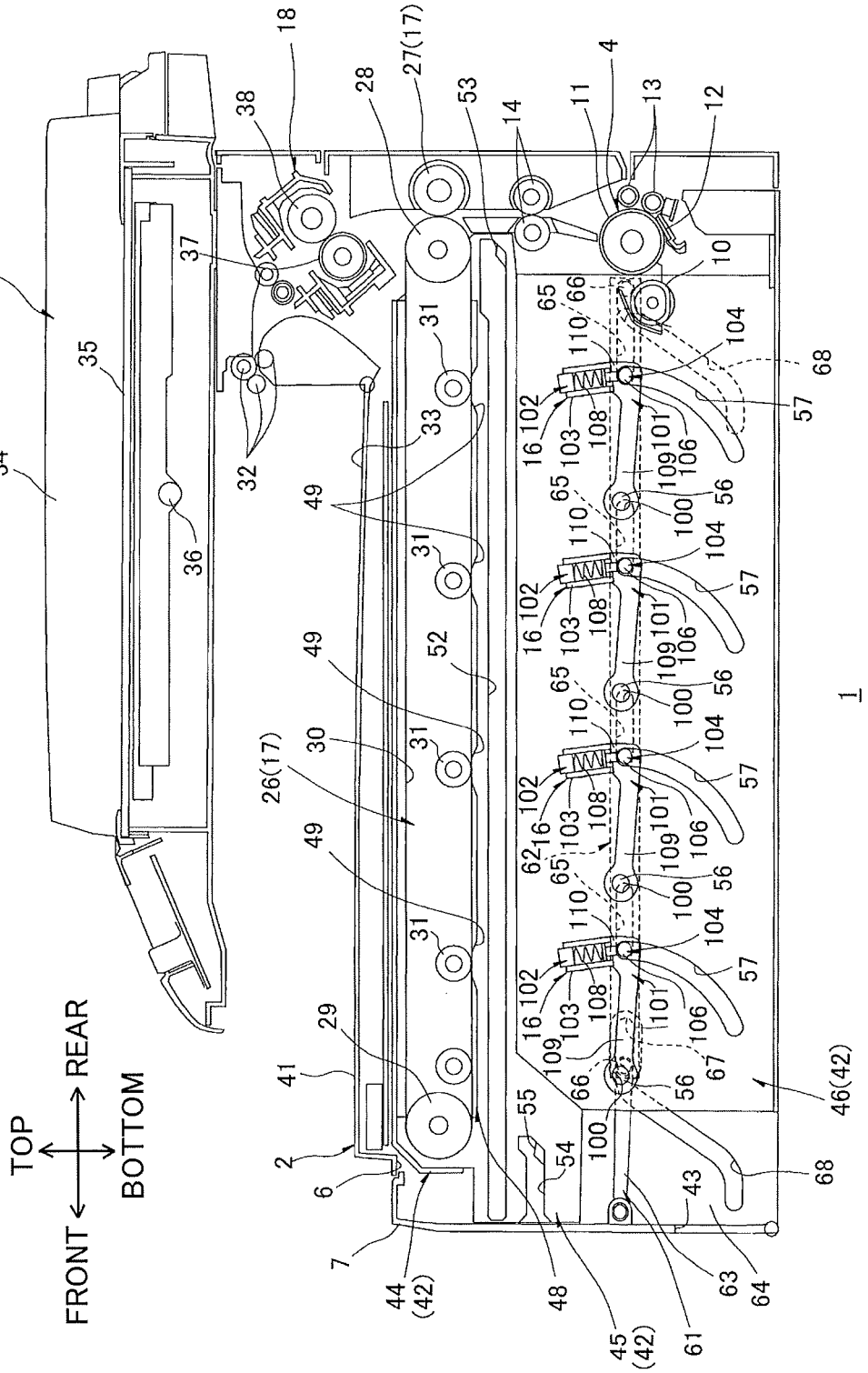
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FIG.4

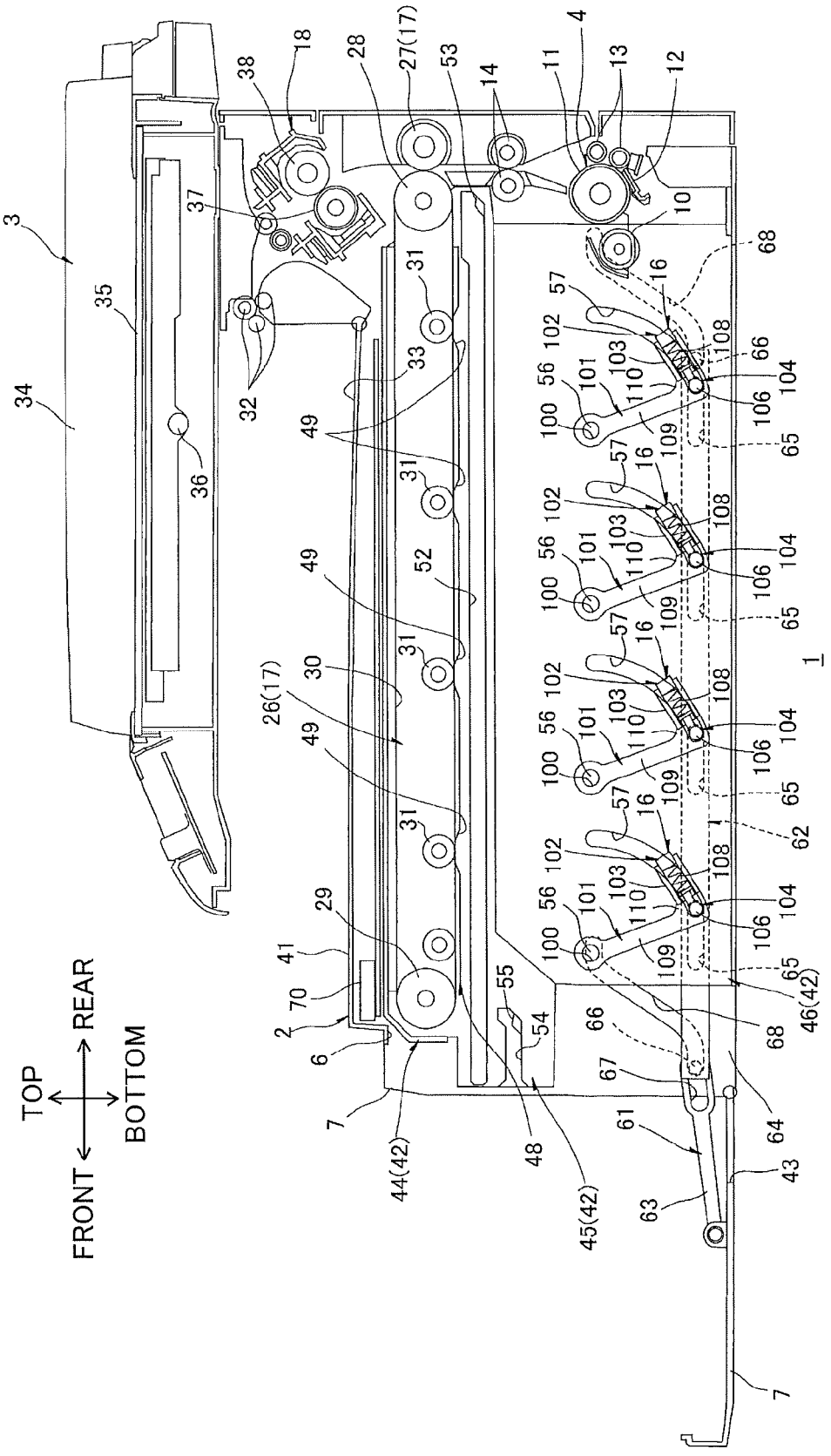
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FIG.5

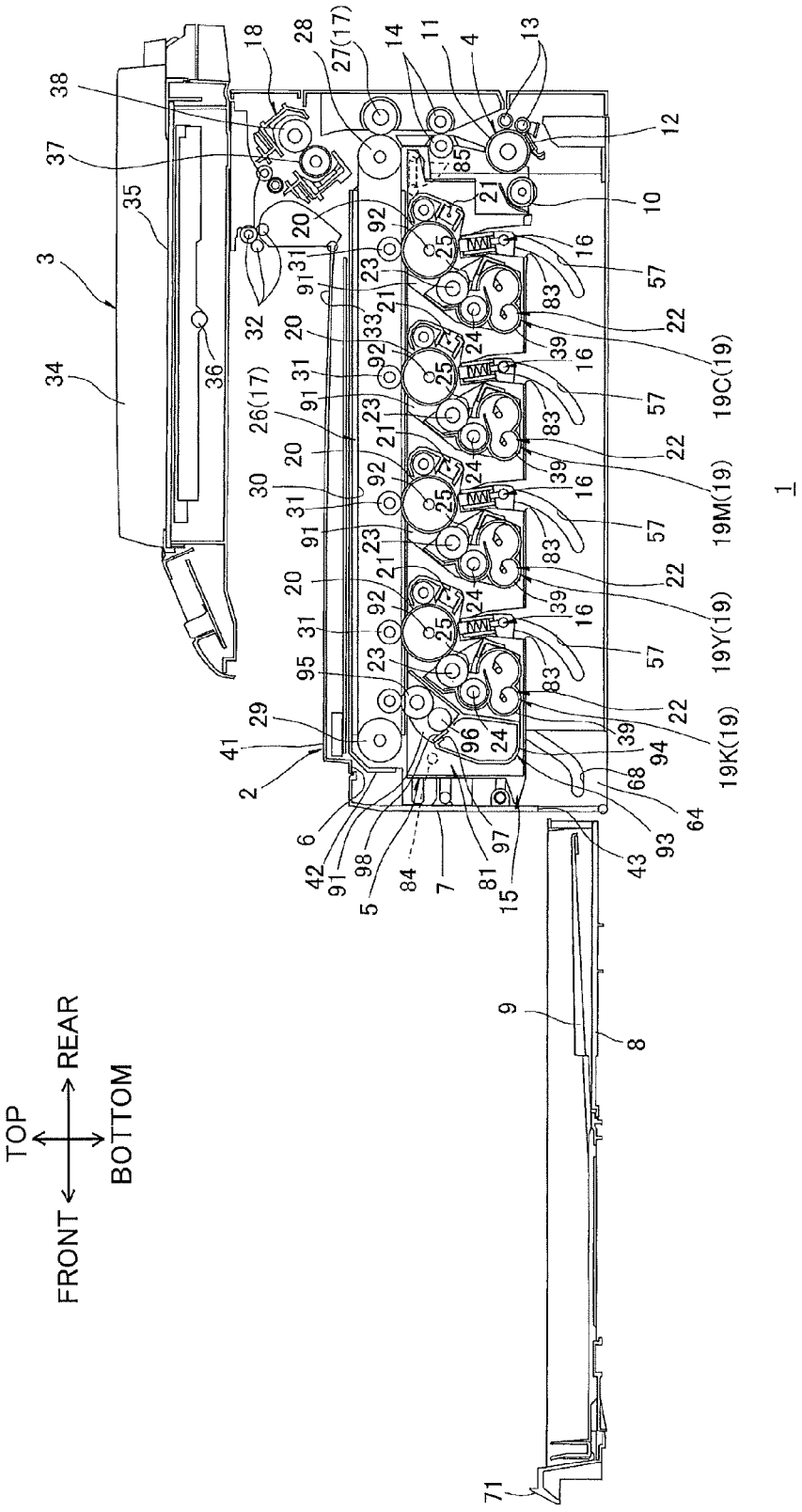

FIG.6

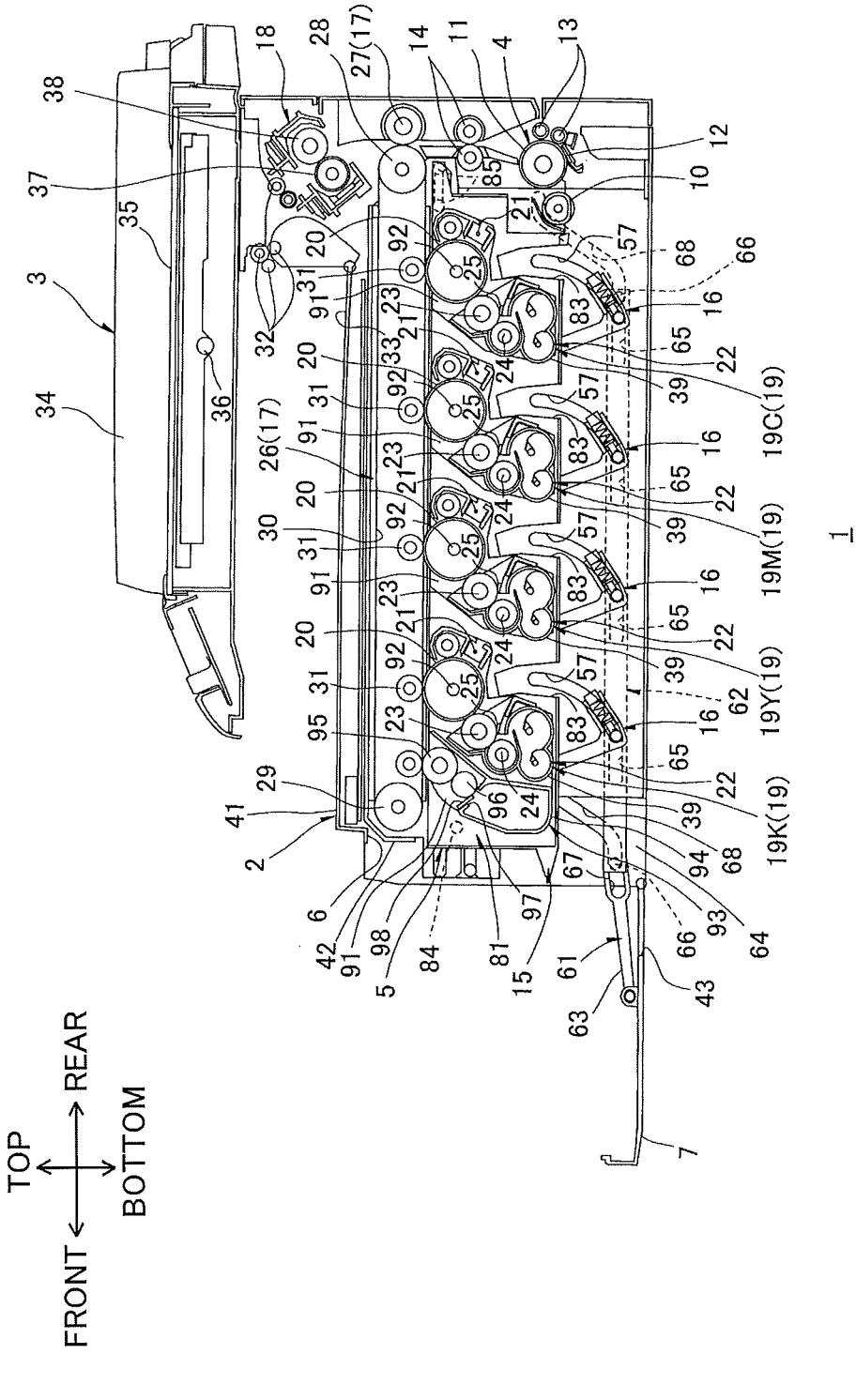

FIG.7

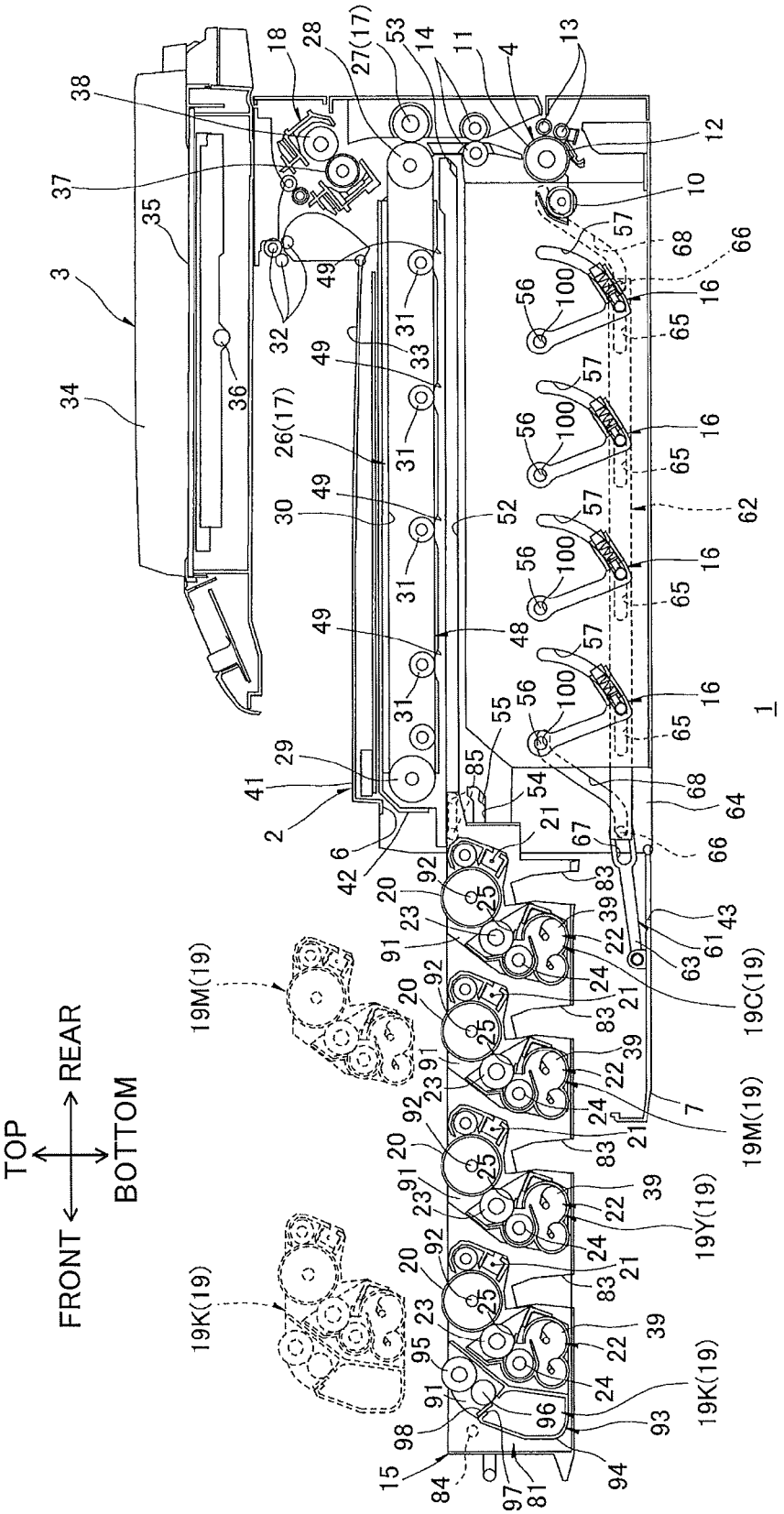
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FIG.8

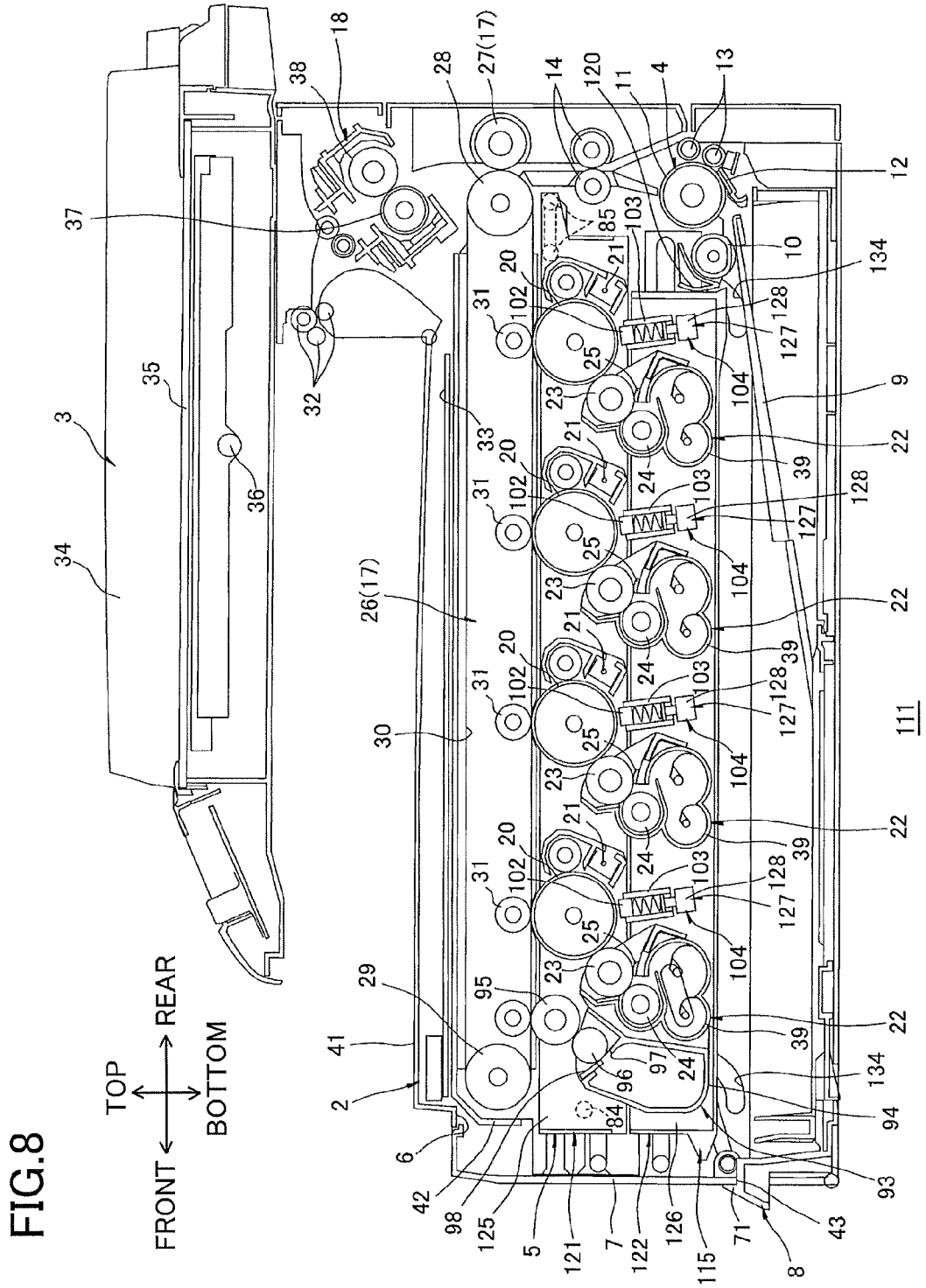

FIG.9

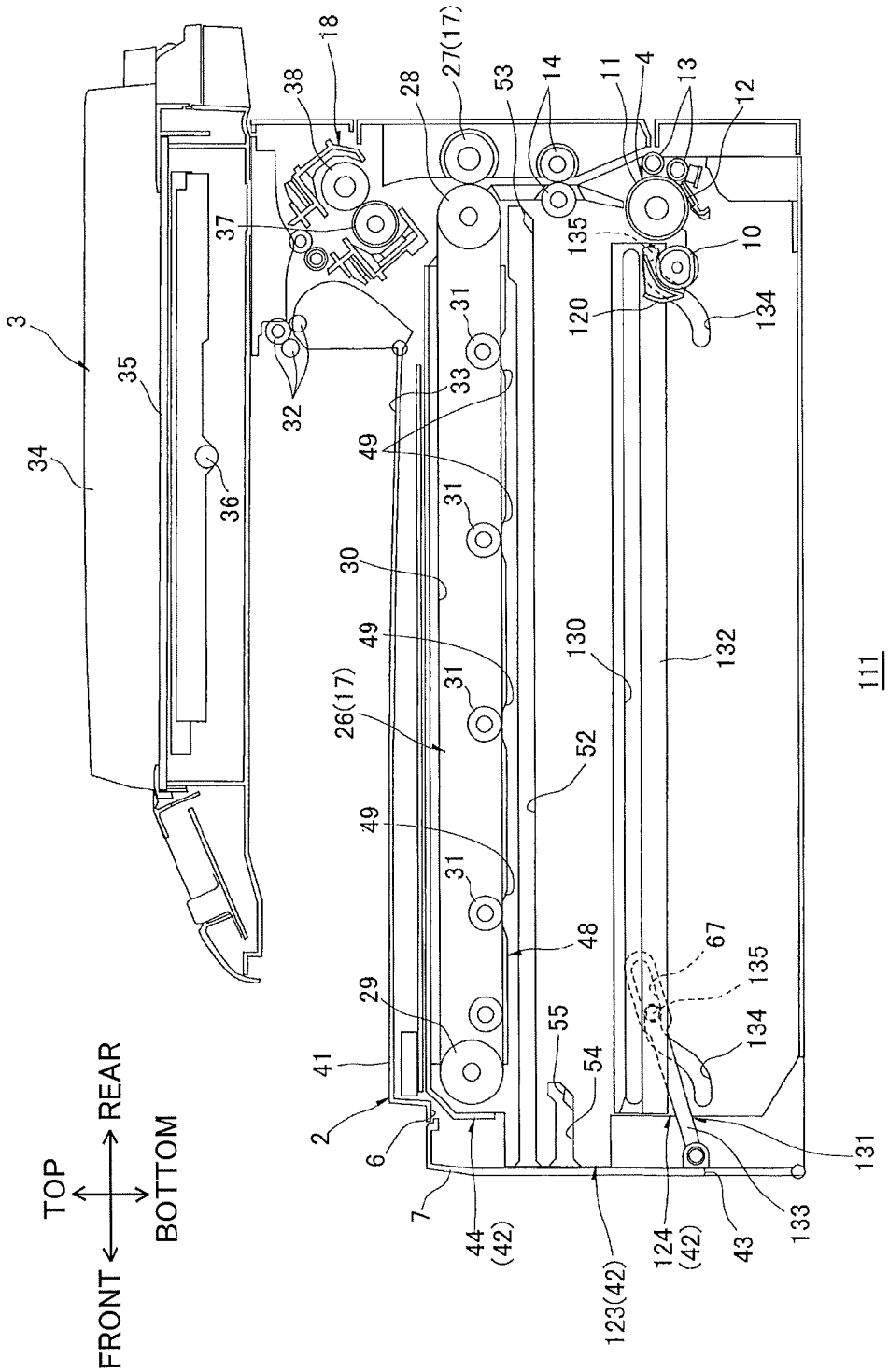
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FIG.10

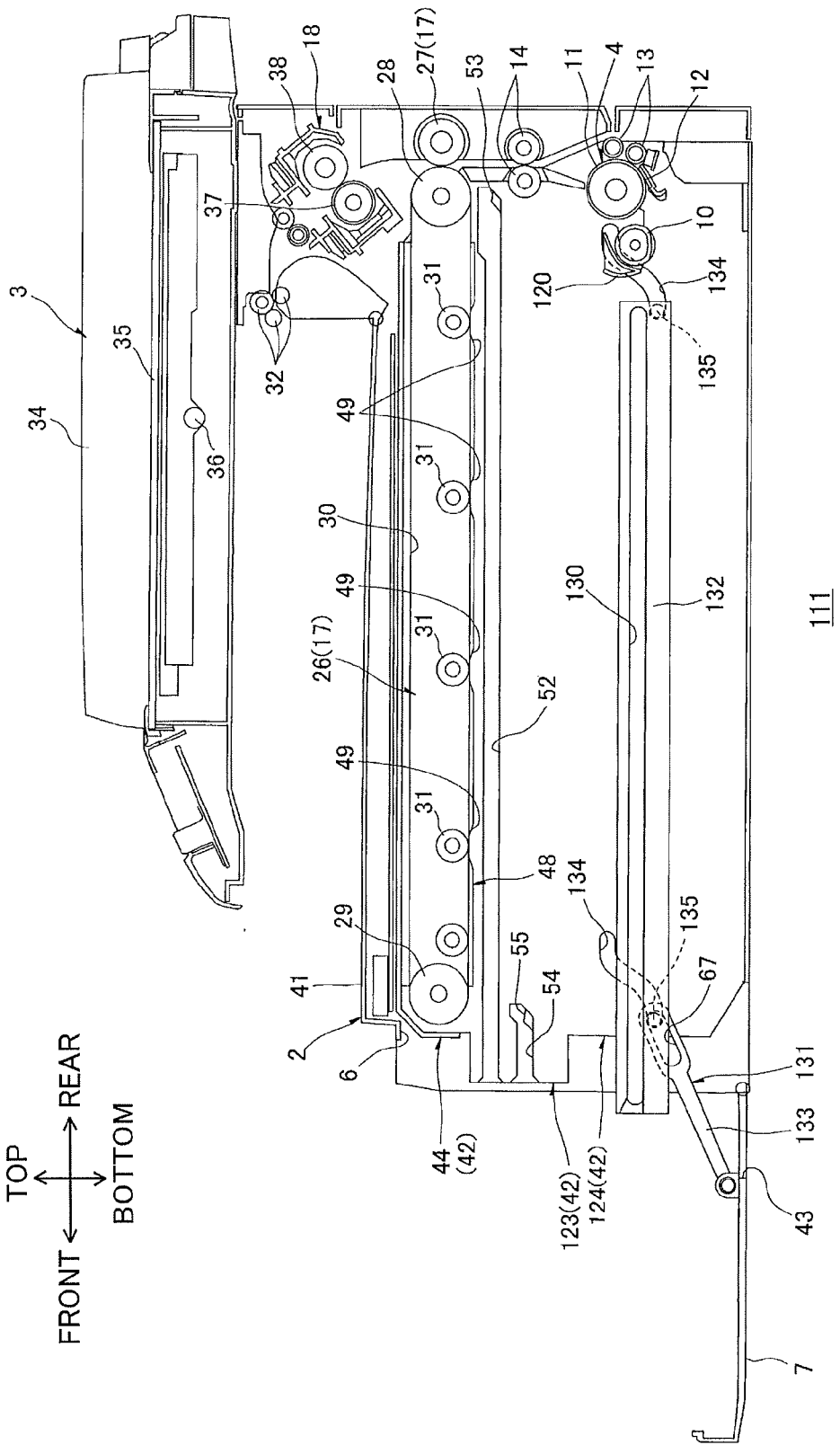
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FIG.11

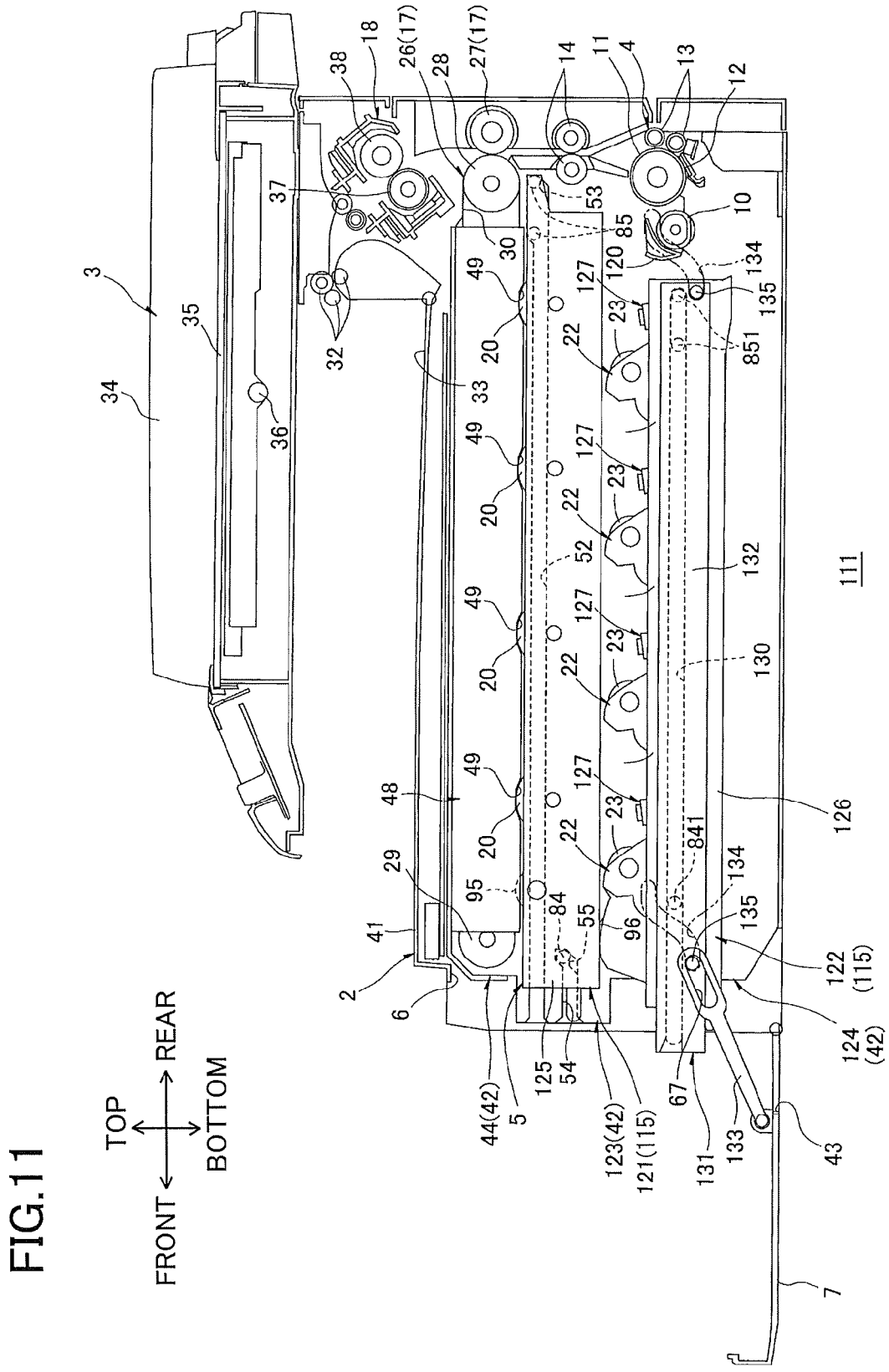

FIG.12

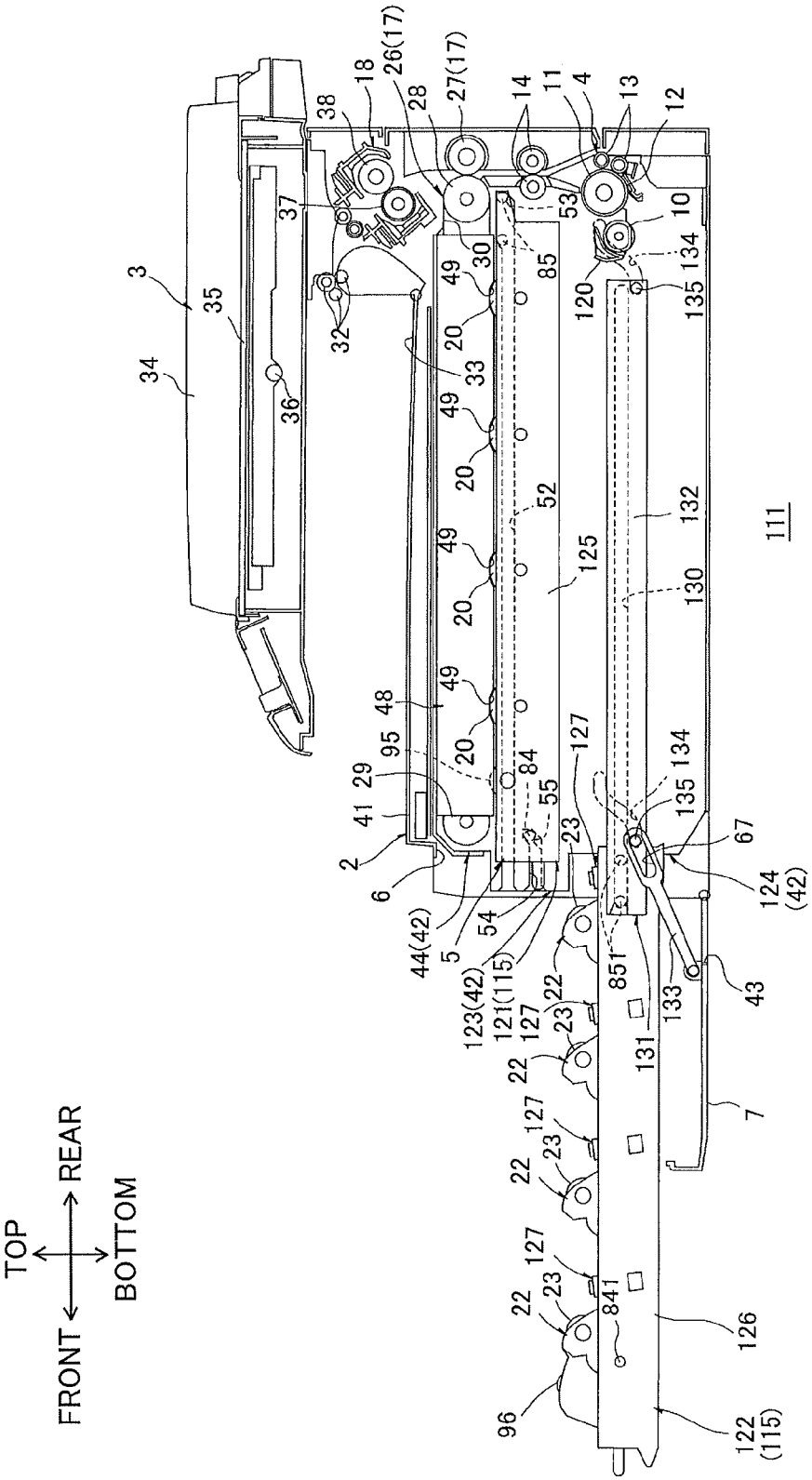
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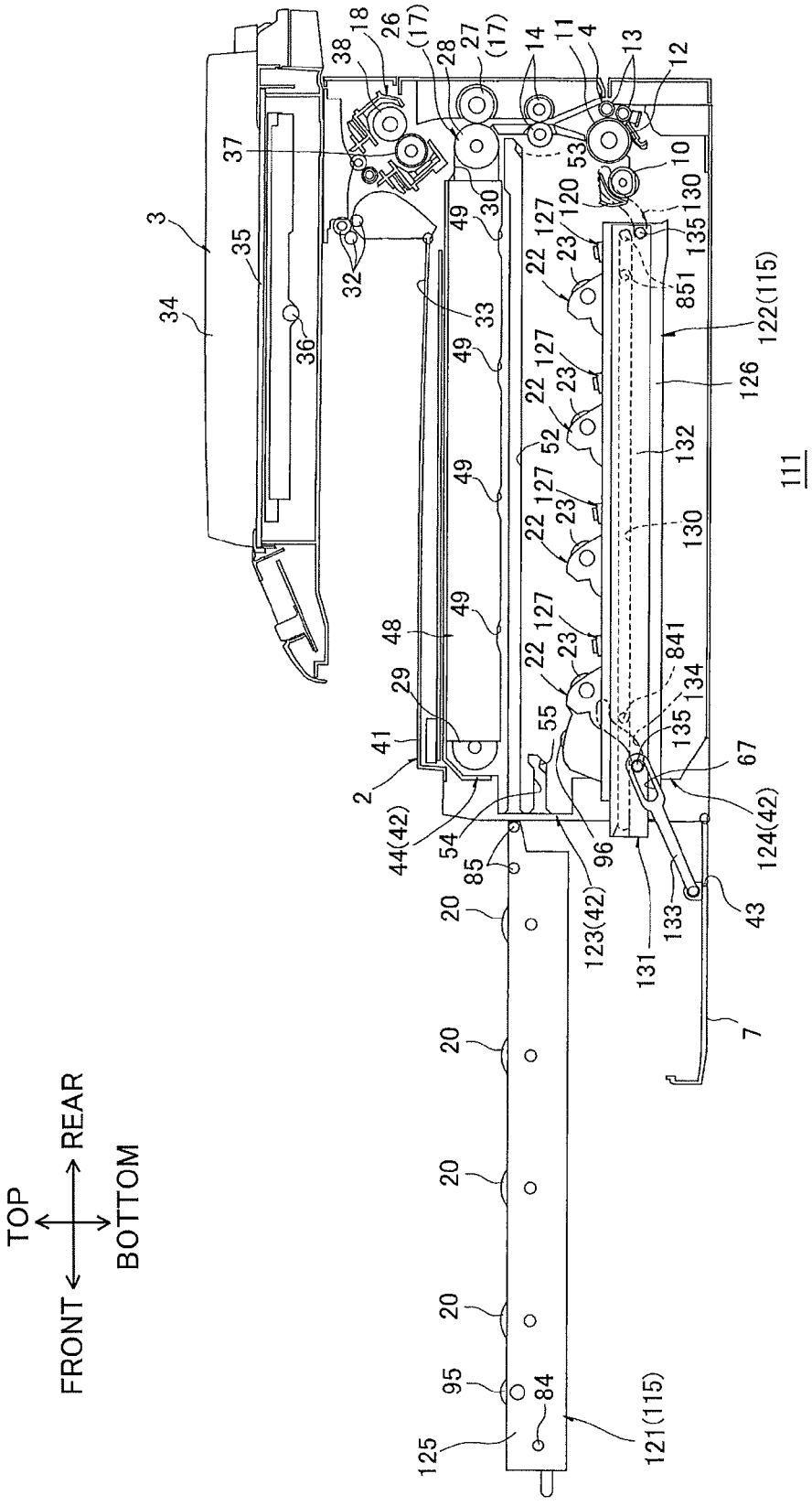
FIG.13



# IMAGE FORMING DEVICE

## CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation of U.S. patent application Ser. No. 13/362,001, filed on Jan. 31, 2012, which claims priority from Japanese Patent Application No. 2011-027518 filed Feb. 10, 2011. The contents of the above noted applications are incorporated herein by reference in their entirety.

## TECHNICAL FIELD

The present invention relates to an image forming device using an electrophotographic method.

## BACKGROUND

As a color printer using an electrophotographic method, an LED exposure type color printer has been conventionally well known in the art. One such LED exposure type color printer includes four photosensitive drums for colors of yellow, magenta, cyan, and black, and four LED exposure units for exposing the corresponding photosensitive drums.

In the LED exposure type color printer, it is required to dispose the LED units adjacent to the corresponding photosensitive drums in order for the photosensitive drums to be exposed by the respective LED units.

Because the LED units are disposed adjacent to the photosensitive drums, the LED units need to be moved away from the photosensitive drums when the photosensitive drums are replaced. For this reason, a mechanism for bringing the LED units close to the corresponding photosensitive drums and moving the LED units away from the corresponding photosensitive drums is required.

A proposal has been made that one such color printer provided with the above-described mechanism includes a main casing having a top cover, a plurality of process units each including a photosensitive drum, and a plurality of LED units for exposing the photosensitive drums. The LED units are connected to the top cover formed on the top of the main casing. In response to open and closure movements of the top cover, the LED units are moved between an exposure position in which the LED units expose the corresponding photosensitive drums and a retracted position in which the LED units are moved upward away from the corresponding photosensitive drums.

Further, another printer including a main casing on which a flatbed scanner is provided, a drum unit having a plurality of photosensitive drums, and a plurality of LED units for exposing the photosensitive drums has been proposed. In this printer, in response to open and closure movements of a front cover provided at a front wall of the main casing, the LED units approach the corresponding photosensitive drums and are moved upward away from the corresponding photosensitive drums.

## SUMMARY

With regard to the former color printer, each LED unit is moved in response to open and closure movements of the top cover.

This structure requires a large space for opening and closing the top cover above the main casing. Accordingly, it may be difficult to reduce a space for placing the color printer.

With regard to the latter printer, the flatbed scanner is disposed above the main casing. Each LED unit is moved in response to open and closure movements of the front cover provided at the front wall of the main casing.

Each LED unit is moved upward away from the corresponding photosensitive drum in this case.

This also requires a space into which the LED units are retracted at an upper portion of the main casing. Hence, downsizing of the main casing may be difficult. Further, it may also be difficult to reduce a space in which the printer is placed.

In view of the foregoing, it is an object of the present invention to provide a compact image forming device having a downsized main casing and capable of reducing a space for placing the image forming device.

In order to attain the above and other objects, the present invention provides an image forming device including a main casing, a retaining member, a belt, a tray, and a pickup roller. The retaining member may be configured to retain a plurality of cartridges juxtaposedly arrayed in a prescribed direction. Each of the plurality of cartridges may include a photosensitive drum, The retaining member may be configured to move in the prescribed direction between a mounted position in which the retaining member is mounted in the main casing and a pulled-out position in which the retaining member is pulled out or the main casing. The belt may be disposed above a plurality of photosensitive drums corresponding to the plurality of cartridges when the retaining member is in the mounted position. The tray may be disposed below the retaining member when the retaining member is in the mounted position. The pickup roller may be configured to pick up a medium accommodated in the tray. A part of the pickup roller may be arranged to overlap with a part of the retaining member in the prescribed direction when the retaining member is in the mounted position.

According to another aspect, the present invention provides an image forming device including a main casing, a first drawer, a second drawer, a belt, a tray, and a pickup roller. The first drawer may be configured to retain a plurality of photosensitive drums juxtaposedly arrayed in a prescribed direction. The first drawer may be configured to move in the prescribed direction between a first mounted position in which the first drawer is mounted in the main casing and a first pulled-out position in which the first drawer is pulled out of the main casing. The second drawer may be configured to retain a plurality of developing cartridges juxtaposedly arrayed in the prescribed direction. Each of the plurality of developing cartridges may include a developing roller. The second drawer may be configured to move in the prescribed direction between a second mounted position in which the second drawer is mounted in the main casing and a second pulled-out position in which the second drawer is pulled out of the main casing. The belt may be disposed above the first drawer to oppose each of the plurality of photosensitive drums when the first drawer is in the first mounted position. The tray may be disposed below the second drawer when the second drawer is in the second mounted position. The pickup roller may be configured to pick up a medium accommodated in the tray. A part of the pickup roller may be arranged to overlap with a part of the second drawer in the prescribed direction when the second drawer is in the second mounted position.

## BRIEF DESCRIPTION OF THE DRAWINGS

The particular features and advantages of the invention as well as other objects will become apparent from the following description taken in connection with the accompanying drawings, in which:

FIG. **1** is a cross-sectional view of a color printer as an image forming device according to a first embodiment of the present invention;

FIG. **2** is a cross-sectional view of the color printer shown in FIG. **1** along the line A-A in FIG. **1**;

FIG. **3** is an explanatory view illustrating interlocking movement of a front cover and LED units provided in the color printer shown in FIG. **1**, in which the front cover is in a closed position and the LED units are in an adjacent position;

FIG. **4** is an explanatory view illustrating the interlocking movement of the front cover and the LED units provided in the color printer shown in FIG. **1**, in which the front cover is in an open position and the LED units are in a retracted position;

FIG. **5** is an explanatory view illustrating removal and mounting of a process cartridge relative to a main casing provided in the color printer shown in FIG. **1**, in which a sheet supply tray has been removed from the main casing;

FIG. **6** is an explanatory view illustrating the removal and mounting of the process cartridge relative to the main casing subsequent to FIG. **5**, in which the front cover is in the open position and the LED units are in the retracted position;

FIG. **7** is an explanatory view illustrating the removal and mounting of the process cartridge relative to the main casing subsequent to FIG. **6**, in which the process unit is in a pulled-out position;

FIG. **8** is a cross-sectional view of a color printer as an image forming device according to a second embodiment of the present invention;

FIG. **9** is an explanatory view illustrating interlocking movement of a front cover and a support member provided in the color printer shown in FIG. **8**, in which the front cover is in a closed position and the support member is in a first position;

FIG. **10** is an explanatory view illustrating the interlocking movement of the front cover and the support member provided in the color printer shown in FIG. **8**, in which the front cover is in an open position and the support member is in a second position;

FIG. **11** is an explanatory view illustrating removal and mounting of a drum drawer and a developing drawer relative to a main casing provided in the color printer shown in FIG. **8**, in which the front cover is in the open position and the developing drawer is in a retracted position after a sheet supply tray has been removed from the main casing;

FIG. **12** is an explanatory view illustrating the removal and mounting of the developing drawer relative to the main casing subsequent to FIG. **11**, in which the developing drawer has been pulled outward from the main casing; and

FIG. **13** is an explanatory view illustrating the removal and mounting of the drum drawer relative to the main casing subsequent to FIG. **11**, in which the drum drawer has been pulled outward from the main casing.

## DETAILED DESCRIPTION

An image forming device according to a first embodiment of the present invention will be described while referring to FIGS. **1** to **7** wherein like parts and components are designated by the same reference numerals to avoid duplicating description.

1. Overall Structure of Color Printer

As shown in FIG. **1**, the image forming device according to the first embodiment is a horizontal intermediate transfer type color printer **1**.

The color printer **1** is a multifunctional device that is integrally provided with a main casing **2** and a flatbed scanner **3** for reading image data from original documents. The flatbed scanner **3** is disposed above the main casing **2**.

Within the main casing **2**, the color printer **1** is further provided with a sheet supply unit **4** and an image forming unit **5**. The sheet supply unit **4** functions to supply a sheet of paper P to the image forming unit **5**. The image forming unit **5** functions to form images on the sheet of paper P supplied from the sheet supply unit **4**.

(1) Main Casing

The main casing **2** has a box shape that is substantially rectangular in a side view. The sheet supply unit **4** and the image forming unit **5** are mounted in the main casing **2**. The main casing **2** has one side wall in which an opening **6** is formed. A front cover **7** is provided on the side wall so as to be pivotally movable about a lower end thereof between a closed position for closing the opening **6** and an open position for opening the opening **6**.

The terms "upward", "downward", "upper", "lower", "above", "below", "beneath", "right", "left", "front", "rear" and the like will be used throughout the description assuming that the color printer **1** is disposed in an orientation in which it is intended to be used. In the following description, the side of the color printer **1** on which the front cover **7** is provided (left side in FIG. **1**) will be referred to as the front side of the color printer **1**, and a side opposite to the side (right side in FIG. **1**) will be referred to as the rear side of the color printer **1**. The top, bottom, left, and right sides of the color printer **1** in the following description will be based on the reference point of a user viewing the color printer **1** from the front side.

(2) Sheet Supply Unit

The sheet supply unit **4** includes a sheet supply tray **8** for accommodating sheets of paper P.

The sheet supply tray **8** is disposed at a bottom portion of the main casing **2**. The sheet supply tray **8** is detachably mounted in the main casing **2**. Further, the sheet supply tray **8** includes a lift member **9** for lifting a rear edge of the sheet P up and down.

The lift member **9** is formed in a generally rectangular plate shape extending in a frontward/rearward direction. The lift member **9** is disposed at a posterior half of a bottom surface of the sheet supply tray **8** and pivotally movable about a front edge thereof. Further, a rear edge of the lift member **9** is urged upward by an urging member (not shown) such as a coil spring.

The lift member **9** is in a slanted posture such that the lift member **9** slants upward toward the rear edge from the front edge by an urging force of the urging member (not shown) when the sheet supply tray **8** is mounted in the main casing **2** (FIG. **1**). When the lift member **9** is in the slanted posture, the rear edge of the sheet P is lifted upward toward a pickup roller **10** (described later) to be pinched between the lift member **9** and the pickup roller **10**.

When the sheet supply tray **8** is removed from the main casing **2**, the lift member **9** is gone down so as to lie down on the bottom surface of the sheet supply tray **8** against the urging force of the urging member (not shown) (FIG. **5**). When the lift member **9** is gone down, the rear edge of the sheet P is accommodated within the sheet supply tray **8**.

The sheet supply unit **4** includes the pickup roller **10**, a sheet supply roller **11**, a sheet supply pad **12**, a pair of pinch rollers **13**, and a pair of registration rollers **14**. The pickup roller **10** is disposed above a rear end portion of the sheet supply tray **8**, and opposite and above the rear edge of the lift member **9**. The sheet supply roller **11** is disposed rearward of the pickup roller **10**. The sheet supply pad **12** is disposed below and opposite the sheet supply roller **11**. The pair of pinch rollers **13** opposes each other in a vertical direction. The

pair of pinch rollers **13** is disposed rearward of the sheet supply roller **11** and contact the sheet supply roller **11**. The pair of registration rollers **14** opposes each other in the frontward/rearward direction and disposed above the sheet supply roller **11**.

The sheets P (indicated by a solid line shown in FIG. **1**) accommodated in the sheet supply tray **8** are conveyed between the sheet supply roller **11** and the sheet supply pad **12** in conjunction with rotation of the pickup roller **10**, and are separated sheet by sheet in conjunction with rotation of the sheet supply roller **11**. Then, in conjunction with rotation of the sheet supply roller **11**, the separated sheet P is conveyed toward the registration rollers **14** while passing between the sheet supply roller **11** and each pinch roller **13**. In conjunction with rotation of the registration rollers **14**, the sheet P is conveyed to the image forming unit **5** (between an intermediate transfer belt **30** (described later) and a secondary transfer roller **27** (described later)) at a prescribed timing.

(3) Image Forming Unit

The image forming unit **5** is disposed above the sheet supply unit **4**. The image forming unit **5** includes a process unit **15**, four LED units **16** corresponding to each color, a transfer unit **17**, and a fixing unit **18**.

(3-1) Process Unit

The process unit **15** is disposed above and opposite the sheet supply tray **8** and also disposed frontward of the sheet supply roller **11** so as to be overlapped with the pickup roller **10** when projected in the frontward/rearward direction. In other words, the process unit **15** is arranged to overlap with the pickup roller **10** in the frontward/rearward direction. The process unit **15** retains four process cartridges **19** corresponding to four colors (cyan, magenta, yellow, and black). Further, the process unit **15** is slidably movable in the frontward/rearward direction between a mounted position in which the process unit **15** is mounted in the main casing **2** and a pulled-out position in which the process unit **15** is pulled out of the main casing **2**.

Four process cartridges **19** are juxtaposedly arrayed with each other at regular intervals in the frontward/rearward direction. More specifically, a black process cartridge **19**K, a yellow process cartridge **19**Y, a magenta process cartridge **19**M, and a cyan process cartridge **19**C are aligned in this order from front to rear.

Further, each process cartridge **19** includes a photosensitive drum **20**, a Scorotron charger **21**, and a developing unit **22**.

The photosensitive drum **20** is cylindrical in shape extending in a rightward/leftward direction (longitudinal direction) and oriented with its axis along the rightward/leftward direction.

The Scorotron charger **21** is disposed diagonally below and rearward of the corresponding photosensitive drum **20**, and confronts but does not contact the corresponding photosensitive drum **20**.

The developing unit **22** is disposed diagonally below and frontward of the corresponding photosensitive drum **20**. The four developing units **22** are juxtaposedly arrayed with each other at regular intervals in the frontward/rearward direction. The developing unit **22** includes a developing roller **23**.

The developing roller **23** is rotatably supported in an upper end of the corresponding developing unit **22**. An upper rear edge of the developing roller **23** is exposed through an upper edge of the developing unit **22** and contacts the corresponding photosensitive drum **20** from below.

The developing unit **22** also includes a supply roller **24** for supplying toner to the corresponding developing roller **23** and a thickness-regulating blade **25** for regulating the thickness of the toner supplied to the developing roller **23**. Further, the developing unit **22** includes a toner accommodating section **39** for accommodating toner for a corresponding color therein. The toner accommodating section **39** is disposed below the supply roller **24**. The toner accommodating section **39** is formed in a configuration such that two cylindrical bodies extending in the rightward/leftward direction are connected to each other in the frontward/rearward direction.

(3-2) LED Unit

Each LED unit **16** is disposed rearward of the corresponding developing unit **22**. Further, the LED unit **16** is disposed below and confronts the corresponding photosensitive drum **20**. The LED unit **16** exposes a surface of the corresponding photosensitive drum **20** based on prescribed image data.

(3-3) Transfer Unit

The transfer unit **17** includes a belt unit **26** and the secondary transfer roller **27**.

The belt unit **26** is disposed above the process unit **15** so as to oppose each photosensitive drum **20** from above and oriented in the frontward/rearward direction.

The belt unit **26** includes a drive roller **28**, a driven roller **29**, the intermediate transfer belt **30**, and four primary transfer rollers **31**.

The drive roller **28** and the driven roller **29** are arranged in confrontation with and spaced apart from each other in the frontward/rearward direction.

The intermediate transfer belt **30** is formed of an endless belt. The intermediate transfer belt **30** is stretched around the drive roller **28** and the driven roller **29**, with a lower portion of the intermediate transfer belt **30** contacting each of the photosensitive drums **20**. The intermediate transfer belt **30** circulates so that the lower portion of the intermediate transfer belt **30** in contact with the photosensitive drums **20** moves rearward.

Each primary transfer roller **31** is disposed in confrontation with the corresponding photosensitive drum **20**, interposing the lower portion of the intermediate transfer belt **30** between the primary transfer roller **31** and the photosensitive drum **20**.

The secondary transfer roller **27** is disposed rearward of the belt unit **26**. Further, the secondary transfer roller **27** is disposed in confrontation with the drive roller **28** of the belt unit **26**, interposing the intermediate transfer belt **30** between the secondary transfer roller **27** and the drive roller **28**.

(3-4) Fixing Unit

The fixing unit **18** is disposed above the secondary transfer roller **27**. The fixing unit **18** includes a heating roller **37** and a pressure roller **38** disposed in confrontation with the heating roller **37**.

(3-5) Image Forming Operations

(3-5-1) Developing Operation

The toner accommodated in the toner accommodating section **39** of the developing unit **22** is supplied to the supply roller **24**, and then to the developing roller **23**.

As the developing roller **23** rotates, the thickness-regulating blade **25** regulates the toner carried on the surface of the developing roller **23** to a prescribed thickness, so that the developing roller **23** carries a uniform thin layer of toner thereon. The toner supplied to the developing roller **23** is positively tribocharged between the thickness-regulating blade **25** and the developing roller **23**.

In the meantime, the Scorotron charger **21** applies uniform charge of positive polarity to a surface of the corresponding photosensitive drum **20** as the photosensitive drum **20** rotates. Subsequently, the LED unit **16** exposes the surface of the corresponding photosensitive drum **20** based on image data.

An electrostatic latent image corresponding to an image to be formed on the sheet P is formed on the surface of the photosensitive drum **20**.

As the photosensitive drum **20** continues to rotate, the positively charged toner carried on the surface of the developing roller **23** is supplied to the electrostatic latent image formed on the surface of the photosensitive drum **20**, thereby developing the electrostatic latent image into a visible toner image through reverse development. Thus, the toner image is formed on the surface of the photosensitive drum **20**.

(3-5-2) Transfer and Fixing Operations

The toner image formed on the surface of each photosensitive drum **20** through reverse development is primary-transferred onto the lower portion of the intermediate transfer belt **30** conveyed rearward from front, thereby forming a color image on the intermediate transfer belt **30**.

The color image formed on the intermediate transfer belt **30** is secondary-transferred onto the sheet P supplied from the sheet supply unit **4** while the intermediate transfer belt **30** passes through a position N where the intermediate transfer belt **30** confronts the secondary transfer roller **27**.

The color image transferred onto the sheet P is thermally fixed to the sheet P by heat and pressure in the fixing unit **18**, as the sheet P passes between the heating roller **37** and the pressure roller **38**.

(4) Discharge

After the color image has been fixed to the sheet P in the fixing unit **18**, the sheet P is discharged by discharge rollers **32** onto a discharge tray **33** formed on a top surface of the main casing **2**.

(5) Flatbed Scanner

The flatbed scanner **3** is disposed above the discharge tray **33**. The flatbed scanner **3** includes a restraining cover **34**, a glass plate **35**, and a CCD sensor **36**. After an original document is placed between the restraining cover **34** and the glass plate **35**, the CCD sensor **36** is slidingly moved to read image data from the original document.

Based on the image data read from the original document, an image is formed on the sheet P in the image forming unit **5** as described above.

2. Main Casing

The main casing **2** includes an outer casing **41** and an inner casing **42** (FIG. **2**). The outer casing **41** defines an outer shell of the color printer **1**. The inner casing **42** is provided inside the outer casing **41**.

(1) Details of Outer Casing

The outer casing **41** is formed in a generally box-shape. The outer casing **41** has a front wall on which the front cover **7** is provided.

The front cover **7** has a lower end that is pivotally movably connected to a bottom wall of the outer casing **41**. An opening **43** is formed in a lower portion of the front cover **7**. When the front cover **7** is in the closed position, the sheet supply tray **8** is inserted into or removed from the main casing **2** through the opening **43**.

(2) Details of Inner Casing

As shown in FIGS. **2** and **3**, the inner casing **42** is of a hollow rectangular cuboid configuration and elongated in the frontward/rearward direction. The inner casing **42** has a vertical length and a lateral (right to left) length such that the process unit **15**, the belt unit **26**, and the sheet supply tray **8** can be accommodated therein. The inner casing **42** is accommodated in the outer casing **41**. The top, right, and left walls of the inner casing **42** are spaced apart from those of the outer casing **41**.

The inner casing **42** includes a belt accommodating section **44** in which the belt unit **26** is accommodated, a process unit supporting section **45** for supporting the process unit **15**, and a LED unit supporting section **46** for supporting the four LED units **16**.

(2-1) Belt Accommodating Section

The belt accommodating section **44** is disposed at an upper portion of the inner casing **42**. The belt accommodating section **44** includes a pair of right and left drum positioning members **48** for positioning each photosensitive drum **20** with respect to the belt unit **26**.

Each of the pair of drum positioning members **48** is formed in a generally plate shape extending in the frontward/rearward direction. The pair of drum positioning members **48** is arranged in confrontation with each photosensitive drum **20** at a position outside of a sheet contacting region of each photosensitive drum **20** in the rightward/leftward direction. (Here, the sheet contacting region represents a region of the photosensitive drum **20** that the sheet P contacts.) The pair of drum positioning members **48** is also arranged spaced apart from each other in the rightward/leftward direction, interposing the belt unit **26** therebetween. An upper portion of each drum positioning member **48** is fixed to the top wall of the inner casing **42**.

As shown in FIG. **3**, each drum positioning member **48** has a lower portion in which four drum positioning recesses **49** corresponding to the four photosensitive drums **20** are formed.

Each drum positioning recess **49** is a substantially U-shaped opened downward. More specifically, the drum positioning recess **49** is depressed upward from a lower edge of the drum positioning member **48**. The four drum positioning recesses **49** are juxtaposedly arrayed with and spaced apart from each other in the frontward/rearward direction. Upper portions of right and left ends of the photosensitive drum **20** are respectively retained in the drum positioning recesses **49** formed in the right and left drum positioning members **48**.

(2-2) Process Unit Supporting Section

As shown in FIG. **3**, the process unit supporting section **45** is disposed immediately below the belt accommodating section **44** at a substantially vertical center of the inner casing **42**. The process unit supporting section **45** has right and left side walls, each formed with a first guide groove **52** and a second guide groove **54**. The first guide groove **52** serves to guide a rear portion of the process unit **15**. The second guide groove **54** serves to guide a front portion of the process unit **15**.

The first guide recess **52** has a height (vertical length) allowing a pair of rear roller **85** (described later) of the process unit **15** to be retained therein. The first guide groove **52** is formed in the process unit supporting section **45** across substantially the entire length in the frontward/rearward direction and extends linearly in the frontward/rearward direction. Further, the first guide groove **52** is formed such that a rear portion of the first guide groove **52** has a height (vertical length) greater than a remaining portion thereof and an interior space of the rear portion is expanded upward. A leaf spring **53** (FIG. **3**) is provided in the rear portion of the first guide groove **52** so as to curve in an arcuate shape with its convex side facing a top surface of the first guide groove **52**.

The leaf spring **53** is a curved metal plate extending in the frontward/rearward direction. The leaf spring **53** has a front end fixed to a bottom surface of the first guide groove **52**. More specifically, the leaf spring **53** extends diagonally above and rearward from the front end, then bends rearward and extends in the frontward/rearward direction.

The second guide groove **54** is disposed below a front portion of the first guide recess **52**. The second guide groove **54** has a height (vertical length) allowing a front roller **84** of

the process unit **15** to be retained therein. The second guide groove **54** extends linearly in the frontward/rearward direction. Further, the second guide groove **54** is formed such that a rear portion of the second guide groove **54** has a height (vertical length) greater than a remaining portion thereof and an interior space of the rear portion is expanded upward. A leaf spring **55** (FIG. **3**) is provided in the rear portion of the second guide groove **54** so as to curve in an arcuate shape with its convex side facing a top surface of the second guide groove **54**.

The leaf spring **55** has a shape that is the same as the leaf spring **53** provided in the first guide groove **52**. The leaf spring **55** has a front end fixed to a bottom surface of the second guide groove **54**.

(2-3) LED Supporting Section

The LED unit supporting section **46** is disposed immediate below the process unit supporting section **45** at a lower portion of the inner casing **42**.

The LED unit supporting section **46** has right and left side walls, each provided with four support bosses **56**. Each support boss **56** functions to support a support arm **101** (described later) of the LED unit **16**. Further, each of the right and left side walls of the LED unit supporting section **46** is formed with four LED unit guide grooves **57**. Each LED unit guide groove **57** functions to guide a support shaft **106** (described later) of the LED unit **16**.

Each right support boss **56** is cylindrical in shape and protrudes inward in the rightward/leftward direction from an inner surface of the right side wall of the LED unit supporting section **46**, that is, protrudes leftward from a left surface of a right side wall of the inner casing **42**. The four right support bosses **56** are juxtaposedly arrayed with each other in the frontward/rearward direction at regular intervals.

Likewise, each left support boss **56** is cylindrical in shape and protrudes inward in the rightward/leftward direction from an inner surface of the left side wall of the LED unit supporting section **46**, that is, protrudes rightward from a right surface of a left side wall of the inner casing **42**. The four left support bosses **56** are juxtaposedly arrayed with each other in the frontward/rearward direction.

Each LED unit guide groove **57** is formed in an arcuate shape that is concentric with the corresponding support boss **56** and extends diagonally below and frontward from a rear side of the corresponding support boss **56**. The LED unit guide groove **57** has a bottom edge part that is overlapped with the sheet supply tray **8** when projected in the rightward/leftward direction (FIG. **5**). In other words, the bottom edge part of the LED unit guide groove **57** is arranged to overlap with the sheet supply tray **8** in the rightward/leftward direction. Further, the LED unit guide groove **57** has a top edge part that is positioned within an LED unit insertion opening **83** (described later) when projected in the rightward/leftward direction (FIG. **6**). In other words, the top edge part of the LED unit guide groove **57** is arranged to overlap with the LED unit insertion opening **83** in the rightward/leftward direction.

3. Sheet Supply Tray

As shown in FIGS. **1** and **2**, the sheet supply tray **8** is formed in a top substantially rectangular box shape with an open top. The sheet supply tray **8** is detachably accommodated in the lower portion of the inner casing **42** (i.e. a lower portion of the LED unit supporting section **46**). The sheet supply tray **8** has a front wall provided with an interference portion **71** at a position confronting an upper periphery of the opening **43** formed in the front cover **7** from front.

The interference portion **71** is an elongated protrusion extending in the rightward/leftward direction and protruding upward from an upper edge of the front wall of the sheet supply tray **8**.

4. Process Unit

(1) Process Frame

The process unit **15** includes a process frame **81** for integrally retaining the four process cartridges **19** therein.

The process frame **81** is formed in a substantially rectangular box shape with an open top. The process frame **81** is formed with four pairs of right and left cartridge guide recesses **82** (FIG. **2**) and four LED unit insertion openings **83**.

Each cartridge guide recess **82** is formed in an inner surface of each side wall of the process frame **81** and extends in the vertical direction. Each cartridge guide recess **82** is a depressed portion having a width allowing a rotation shaft **92** (described later) of the corresponding photosensitive drum **20** to be retained therein.

Each LED unit insertion opening **83** is positioned below the corresponding pair of cartridge guide recesses **82**. Each LED unit insertion opening **83** is formed in the process frame **81** across the entire length in the rightward/leftward direction such that the right and left side walls of the process frame **81** is cut out upward from bottom edges thereof. More specifically, each LED unit insertion opening **83** is defined by a bottom opening **86** and a pair of right and left side openings **87**. The bottom opening **86** is formed in the bottom wall of the process frame **81** across the entire length in the rightward/leftward direction. The right side opening **87** is formed in the right side wall of the process frame **81** so as to be connected to the bottom opening **86**. The left side opening **87** is formed in the left side wall of the process frame **81** so as to be connected to the bottom opening **86**.

Each of the right and left side walls of the process frame **81** is provided with the front roller **84** and the pair of rear rollers **85**. The front roller **84** disposed at the right side wall is rotatably provided in a front portion of the right side wall and protrudes outward (rightward) in the rightward/leftward direction from the right side wall. Likewise, the front roller **84** disposed at the left side wall is rotatably provided in a front portion of the left side wall and protrudes outward (leftward) in the rightward/leftward direction from the left side wall.

Further, the pair of two rear rollers **85** disposed at the right side wall is rotatably provided in a rear portion of the right side wall and protrudes outward (rightward) from the right side wall in the rightward/leftward direction. Likewise, the set of two rear rollers **85** disposed at the left side wall is rotatably provided in a rear portion of the left side wall and protrudes outward (leftward) from the left side wall in the rightward/leftward direction.

(2) Process Cartridge

Each process cartridge **19** has a pair of side plates **91** arranged in confrontation with and spaced apart from each other in the rightward/leftward direction. The photosensitive drum **20**, the Scorotron charger **21**, and the developing unit **22** are disposed between the side plates **91**.

The rotation shaft **92** of the photosensitive drum **20** has right and left ends penetrating the right and left side plates **91** respectively and rotatably supported to the side plates **91**. Further, the right and left ends of the rotation shaft **92** protrude outward in the rightward/leftward direction from outer surfaces of the right side plate **91**, respectively.

The black process cartridge **19**K integrally retains a belt cleaning unit **93**. The belt cleaning unit **93** is disposed frontward of the developing unit **22** of the black process cartridge **19**K.

The belt cleaning unit **93** includes a waste toner retaining section **94**, a scraping roller **96**, a scraping blade **98**, and a belt cleaning roller **95**.

The waste toner retaining section **94** is formed in a generally box-shape having a top opening **97**.

The scraping roller **96** is disposed above the opening **97** formed in the waste toner retaining section **94**. The scraping roller **96** is arranged in confrontation with the opening **97**.

The scraping blade **98** is formed in a generally plate shape extending in the frontward/rearward direction. The scraping blade **98** has a front end (base end) that is fixed to the waste toner retaining section **94** at a front periphery of the opening **97** and a rear end (free end) that contacts the scraping roller **96** from below.

The belt cleaning roller **95** is rotatably supported to an upper portion of the belt cleaning unit **93** so as to contact the scraping roller **96** from above.

The belt cleaning unit **93** is arranged such that the belt cleaning roller **95** contacts the lower portion of the intermediate transfer belt **30** from below. The belt cleaning unit **93** functions to clean waste toner deposited on the surface of the intermediate transfer belt **30** by the belt cleaning roller **95**. After the waste toner carried on the belt cleaning roller **95** is supplied to the scraping roller **96**, the waste toner carried on the scraping roller **96** is scraped off with the scraping blade **98**. Hence, the waste toner is collected in the waste toner retaining section **94**.

5. LED Unit

As shown in FIGS. **2** and **3**, the four LED units **16** are supported in the LED unit supporting section **46**. Within the LED unit supporting section **46**, each LED unit **16** is pivotally movable between a retracted position (FIG. **4**) in which the LED units **16** are moved away from the photosensitive drums **20** and an adjacent position (FIG. **3**) in which each LED unit **16** is adjacent to the corresponding photosensitive drum **20** to expose thereof. In the retracted position, each LED unit **16** is retracted downward so as to be moved away from the corresponding photosensitive drum **20**. In other words, each LED unit **16** is retracted (moved) in a direction intersecting with the frontward/rearward direction so as to be moved away from the corresponding photosensitive drum **20**. In the adjacent position, the LED unit **16** extends in the vertical direction so as to be located adjacent to the corresponding photosensitive drum **20**.

Note that, in the following description with reference to the LED unit **16**, directions related to the LED unit **16** will be referred as if the LED unit **16** was in the adjacent position.

Each LED unit **16** includes a pair of right and left support arms **101**, an LED array support member **104** disposed between the right and left support arms **101**, and an LED array **102** supported to the LED array support member **104**.

Each of the right and left support arms **101** is formed of a flat plate shape and also a generally L-shape in a side view, extending in the frontward/rearward direction. Each of the right and left support arms **101** integrally includes an arm portion **109** and a support portion **110**.

The right and left arm portions **109** are respectively connected to the right and left support bosses **56**. The right and left support portions **110** are adapted to support right and left ends of the LED array support member **104**, respectively.

Each arm portion **109** is formed in a generally lever shape extending in the frontward/rearward direction. Each arm portion **109** has a front portion formed with an engagement hole **100**.

Each of the engagement holes **100** is a generally circular shaped hole and has a diameter allowing the support boss **56** to be fitted thereinto. Each engagement hole **100** penetrates the corresponding arm portion **109**.

Each support portion **110** is formed in a generally lever shape extending upward from a rear end of the arm portion **109**.

The LED array supporting member **104** includes the support shaft **106** and an LED array accommodating member **103**.

The support shaft **106** is formed in a generally cylindrical shape extending in the rightward/leftward direction. The support shaft **106** has a length in the rightward/leftward direction greater than that of the inner casing **42** (see FIG. **2**). Further, the support shaft **106** has a right and left ends each penetrating through the corresponding arm portion **109** of the support arm **101** so that each end of the support shaft **106** protrudes outward from an outer surface of the right support arm **101** in the rightward/leftward direction.

The LED array accommodating member **103** is formed in a generally rectangular frame shape having a bottom wall and elongated in the rightward/leftward direction. The bottom wall of the LED array accommodating member **103** is connected to the support shaft **106**. The LED array accommodating member **103** has right and left side walls disposed between the right support portion **110** of the right support arm **101** and the left support portion **110** of the left support arm **101**. The LED array accommodating section **103** has an internal dimension in the frontward/rearward direction almost the same as (slightly greater than) an external dimension of the LED array **102** in the frontward/rearward direction. Further, the LED array accommodating member **103** has an internal dimension in the rightward/leftward direction almost the same as (slightly greater than) an external dimension of the LED array **102** in the rightward/leftward direction.

The LED array **102** is formed in a generally quadrangular prism shape and elongated in the rightward/leftward direction. The LED array **102** integrally holds a plurality of LEDs arrayed in the rightward/leftward direction therein. The LED array **102** has a length in the rightward/leftward direction smaller than that of the photosensitive drum **20** but greater than that of the sheet contacting region.

The LED array **102** has right and left ends, each having an LED positioning member **105** for positioning the LED array **102** relative to the corresponding photosensitive drum **20**.

Each LED positioning member **105** is formed in a plate shape that is substantially rectangular in a side view. The LED positioning members **105** are arranged to slightly protrude upward from respective right and left edges of the LED array **102**. The LED positioning members **105** contact the photosensitive drum **20** from below, thereby positioning the LED array **102** relative to the corresponding photosensitive drum **20** such that the LED array **102** is in confrontation with the corresponding photosensitive drum **20** at an interval corresponding to the protruding length of the LED positioning members **105**. It should be noted that the LED positioning member **105** is not limited to the rectangular plate shape. For example, the LED positioning member **105** may be a generally disk shaped roller.

The LED array **102** is movable relative to the LED array accommodating member **103**. The LED array **102** has a lower portion that is accommodated in an upper portion of the LED array accommodating member **103**. The LED array **102** is resiliently supported to the bottom wall of the LED array accommodating member **103** by a pair of right and left compression springs **108**.

More specifically, the right compression spring **108** has one end connected to a right end of the bottom wall of the LED array accommodating member **103** and another end

connected to a right end of the LED array **102**. Likewise, the left compression spring **108** has one end connected to a left end of the bottom wall of the LED array accommodating member **103** and another end connected to a left end of the LED array **102**. With this configuration, the LED array **102** is resiliently supported relative to the bottom wall of the LED array accommodating member **103** via the right and left compression springs **108**.

Each LED unit **16** is pivotally movably supported relative to the inner casing **42**, by fitting the right and left support bosses **56** of the inner casing **42** into the right and left engagement holes **100** respectively formed in the right and left support arms **101** and by inserting the right and left ends of the support shaft **106** into the right and left LED unit guide grooves **57**. Note that the right end of the support shaft **106** is positioned between the inner casing **42** and a right guide member **64** (described later) and the left end of the support shaft **106** is positioned between the inner casing **42** and a left guide member **64** (described later).

Further, each LED unit **16** is constantly biased downward due to its self-weight.

When the LED unit **16** is in the adjacent position, the right and left ends of the support shaft **106** are positioned in the top edges of the right and left LED unit guide grooves **57**, respectively (FIG. **3**). When the LED unit **16** is in the retracted position, the right and left ends of the support shaft **106** are positioned in the bottom edges of the right and left LED unit guide grooves **57**, respectively (FIG. **4**).

6. Interlocking Mechanism

(1) Structure of Interlocking Mechanism

Within the main casing **2**, a pair of right and left interlocking mechanisms **61** are provided. The pair of right and left interlocking mechanisms **61** is adapted to move the four LED units **16** in interlocking relation to the movement of the front cover **7**. The right interlocking mechanism **61** is provided at the right side wall of the inner casing **42** and disposed between the inner casing **42** and the outer casing **41**. The left interlocking mechanism **61** is provided at the left side wall of the inner casing **42** and disposed between the inner casing **42** and the outer casing **41**.

Each of the right and left interlocking mechanisms **61** includes a first connection member **62** for connecting the four LED units **16** to each other, a second connection member **63** (FIG. **3**) for connecting the first connection member **62** to the front cover **7**, and the guide member **64** for guiding the movement of the first connection member **62**.

The first connection member **62** is formed in a generally flat plate shape and elongated in the frontward/rearward direction. The first connection member **62** is formed with four through-holes **65** into which the four support shafts **106** of the four LED units **16** are inserted respectively. Further, the first connection member **62** is provided with a pair of front and rear guide bosses **66** respectively fitted into a pair of front and rear connection member guide grooves **68** (described later) formed in the guide member **64**.

Each through-hole **65** is an elongated hole extending in the frontward/rearward direction. The four right through-holes **65** are juxtaposedly arranged with each other at regular intervals in the frontward/rearward direction. Each right through-hole **65** has a vertical length allowing the right end of the support shaft **106** of the LED unit **16** to be inserted thereinto. Likewise, the four left through-holes **65** are juxtaposedly arranged with each other at regular intervals in the frontward/rearward direction. Each left through-hole **65** has a vertical length allowing the left end of the **106** of the LED unit **16** to be inserted thereinto.

Each guide boss **66** is formed in a generally cylindrical shape. The pair of front and rear guide bosses **66** of each first connection member **62** protrudes outward in the rightward/leftward direction from an outer surface of each first connection member **62** in the rightward/leftward direction. The front guide boss **66** is provided at a front end portion of each first connection member **62** and the rear guide boss **66** is disposed at a rear end portion of each first connection member **62**.

The second connection member **63** is formed in a generally lever shape and elongated in the frontward/rearward direction. The second connection member **63** has a front end portion that is swingably connected to the front cover **7**. Further, each second connection member **63** has a rear end portion formed with a connection hole **67** to which the front guide boss **66** of the first connection member **62** is connected.

The connection hole **67** is an elongated hole extending in the frontward/rearward direction. The connection hole **67** has a vertical length allowing the front guide boss **66** of the first connection member **62** to be inserted thereinto.

The guide member **64** is formed in a generally flat plate shape elongated in the frontward/rearward direction and bent inward from its top and bottom edges in the rightward/leftward direction, thereby covering the exterior of the LED unit supporting section **46** in the rightward/leftward direction. With this configuration, a generally rectangular shaped space in a front view is defined by the right side wall of the inner casing **42** and the right guide member **64** at a position rightward of the LED unit supporting section **46**. Another generally rectangular shaped space in a front view is also defined by the left side wall of the inner casing **42** and the left guide member **64** at a position leftward of the LED unit supporting section **46**.

Each guide member **64** is formed with the pair of front and rear connection member guide grooves **68** for guiding the pair of front and rear guide bosses **66** of each first connection member **62**.

Each of the front and rear connection member guide grooves **68** formed in the guide members **64** is depressed outward from an inner surface of the guide member **64** in the rightward/leftward direction. Further, each connection member guide groove **68** is formed in a generally crank-shape (S-shape) in a side view extending diagonally below and frontward from an upper rear side. Each connection member guide groove **68** has a width allowing the corresponding guide boss **66** of the first connection member **62** to be inserted thereinto. Further, each connection member guide groove **68** has a top edge that is arranged to overlap with that of each LED unit guide groove **57** when projected in the frontward/rearward direction and a bottom edge that is arranged to overlap with that of each LED unit guide groove **57** when projected in the frontward/rearward direction (FIG. **3**).

The front guide boss **66** of each first connection member **62** is inserted into the front connection member guide groove **68** formed in the guide member **64** through the connection hole **67** formed in the second connection member **63**. The rear guide boss **66** of each first connection member **62** is also inserted into the rear connection member guide groove **68** formed in the guide member **64**. The first connection members **62** are thus connected to the front cover **7** through the second connection members **63** and also supported to the guide members **64**.

When the front cover **7** is in the closed position, each first connection member **62** is positioned at a first position (FIG. **3**) in which the corresponding front and rear guide bosses **66** are respectively positioned at upper rear end portions of the corresponding front and rear connection member guide grooves **68**. At this time, each first connection member **62** confronts

the top edge of each LED unit guide groove **57** in the rightward/leftward direction. The top edge of each LED unit guide groove **57** is arranged to overlap with a front edge of each through-hole **65** in the rightward/leftward direction.

Further, when the front cover **7** is moved to the open position from the closed position, each first connection member **62** is pulled diagonally below and frontward by the corresponding second connection member **63** and slidingly moved diagonally below and frontward while each pair of front and rear guide bosses **66** is guided by the corresponding pair of front and rear connection member guide grooves **68**.

Further, when the front cover **7** reaches the open position, each first connection member **62** is positioned at a second position (FIG. **4**) in which the corresponding front and rear guide bosses **66** are respectively positioned at lower front end portions of the corresponding front and rear connection member guide grooves **68**. At this time, each first connection member **62** confronts the bottom edge of each LED unit guide groove **57** in the rightward/leftward direction. The bottom edge of each LED unit guide groove **57** is arranged to overlap with a rear edge of each through-hole **65** in the rightward/leftward direction.

When the front cover **7** is moved to the closed position from the open position, each first connection member **62** is pushed diagonally above and rearward by the corresponding second connection member **63** and slidingly moved diagonally above and rearward while each pair of front and rear guide bosses **66** is guided by the corresponding pair of front and rear connection member guide grooves **68**. As a result, each first connection member **62** is moved to the first position from the second position.

(2) Interlocking Movement of Front Cover and Each LED Unit

As shown in FIG. **2**, each LED unit **16** is connected to the pair of right and left interlocking mechanisms **61**, by inserting the right and left ends of the corresponding support shaft **106** into the corresponding through-holes **65** at a position between the inner casing **42** and the guide member **64**.

When the front cover **7** is in the closed position and each first connection member **62** is in the first position, the right and left ends of the support shaft **106** of each LED unit **16** are respectively retained by the right and left first connection members **62** at the respective top edges of the corresponding pair of right and left LED unit guide grooves **57**. At this time, each LED unit **16** is in the adjacent position (FIG. **3**).

At this time, as shown in FIG. **5**, each LED unit **16** is positioned inside the corresponding LED unit insertion opening **83** of the process unit **15**.

Then, when the front cover **7** is moved to the open position from the closed position, in conjunction with the movement of each first connection member **62** from the first position to the second position, each LED unit **16** is pivotally moved in a clockwise direction as viewed from a right side due to its self-weight so as to be retracted downward.

Further, as shown in FIG. **4**, when the front cover **7** reaches the open position and each first connection member **62** is in the second position, the right and left ends of the support shaft **106** of each LED unit **16** are respectively retained by the right and left first connection members **62** at the respective bottom edges of the corresponding pair of the right and left LED unit guide grooves **57**. At this time, each LED unit **16** is in the retracted position (FIG. **4**).

At this time, as shown in FIG. **6**, each LED unit **16** is retracted (moved) downward from the corresponding LED unit insertion opening **83** of the process unit **15** such that the LED units **16** do not interfere with the process unit **15** in the rightward/leftward direction when the process unit **15** is mounted in or removed from the main casing **2**.

Then, when the front cover **7** is moved to the closed position from the open position, in conjunction with the movement of each first connection member **62** from the second position to the first position, each LED unit **16** is pivotally moved in a counterclockwise direction as viewed from a right side about the corresponding pair of right and left support bosses **56** against gravity. As a result, each LED unit **16** is moved toward the adjacent position from the retracted position.

7. Removal and Mounting of Process Cartridge Relative to Main Casing

To remove the process cartridge **19** from the main casing **2** or to mount the process cartridge **19** in the main casing **2**, initially, the front cover **7** is moved to the open position to pull the process unit **15** outward from the main casing **2**.

When the sheet supply tray **8** is mounted in the main casing **2**, the interference portion **71** of the sheet supply tray **8** confronts the upper periphery of the opening **43** formed in the front cover **7** from front. Because of this structure, even if the user intends to move the front cover **7** to the open position from the closed position, the interference portion **71** interferes with the front cover **7**. Accordingly, the movement of the front cover **7** to the open position is restricted by the interference portion **71**.

As shown in FIG. **5**, the user initially pulls the sheet supply tray **8** frontward to remove the sheet supply tray **8** from the main casing **2**. As a result of removal of the sheet supply tray **8** from the main casing **2**, a space is formed at a position below the process unit **15**.

Next, to remove the process unit **15** from the main casing **2**, as shown in FIG. **6**, the front cover **7** is moved to the open position from the closed position to open the opening **6**.

Then, as described above, in response to the movement of the front cover **7** to the open position from the closed position, each LED unit **16** is moved to the retracted position so as to be moved to the space formed by removing the sheet supply tray **8** from the main casing **2**.

Subsequently, as shown in FIG. **7**, the process unit **15** is pulled frontward from the main casing **2** through the opening **6**. At this time, since the LED units **16** is in the retracted position, the LED units **16** do not interfere with the movement of the process unit **15** in the rightward/leftward direction.

Then, each rearmost roller **85** of the process unit **15** is separated from the corresponding leaf spring **53** at the rear portion of the corresponding first guide groove **52**. Each front roller **84** of the process unit **15** is also separated from the corresponding leaf spring **55** at the rear portion of the corresponding second guide groove **54**. As a result, the process unit **15** is moved downward so that each photosensitive drum **20** is separated from the lower portion of the intermediate transfer belt **30**.

Subsequently, when the process unit **15** is further pulled frontward, the process unit **15** is guided by the right and left first guide grooves **52** and the right and left second guide grooves **54**, and pulled outward from the main casing **2** while maintaining a slight gap between the lower portion of the intermediate transfer belt **30** and the process unit **15**.

Subsequently, the process cartridge **19** is removed from the pulled-out process unit **15**. More specifically, to remove the process cartridge **19** from the process unit **15**, the process cartridge **19** is pulled upward. To mount the process cartridge **19** in the process unit **15**, the process cartridge **19** is positioned above the process frame **81** so that the right and left ends of the rotation shaft **92** of the photosensitive drum **20** are respectively disposed above the right and left cartridge guide

recesses **82**. Then, the process cartridge **19** is moved downward to be inserted into the process frame **81** from above.

By performing, in reverse order, the above-described operation for removing the process unit **15** from the main casing **2**, the process unit **15** is mounted in the main casing **2**.

More specifically, the process unit **15** is inserted into the main casing **2** along the first guide grooves **52** and the second guide grooves **54**.

At this time, the process unit **15** is guided by the first guide grooves **52** and the second guide grooves **54** to be inserted into the main casing **2**, while maintaining a slight gap between the lower portion of the intermediate transfer belt **30** and the process unit **15**.

Then, each rearmost roller **85** of the process unit **15** rides up over the corresponding leaf spring **53** at the rear portion of the corresponding first guide groove **52**. Each front roller **84** of the process unit **15** also rides up over the corresponding leaf spring **55** at the rear portion of the corresponding second guide groove **54**. The process unit **15** is thus moved upward so that each photosensitive drum **20** is brought into contact with the lower portion of the intermediate transfer belt **30**.

As a result, the process unit **15** is mounted in the main casing **2** so as to be constantly biased upward by the biasing forces of the leaf spring **53** and the leaf spring **55**.

Then, after the front cover **7** is moved to the closed position from the open position, the sheet supply tray **8** is mounted in the main casing **2** through the opening **43** of the front cover **7**.

p8. Operations and Effects

(1) In the color printer **1** according to the first embodiment of the present invention, as shown in FIG. **6**, each LED unit **16** is moved to the space formed by removing the sheet supply tray **8** from the main casing **2** to be moved to the retracted position such that the LED units **16** do not interfere with the process unit **15**, in which the photosensitive drums **20** are retained, in the rightward/leftward direction when the process unit **15** is mounted in or removed from the main casing **2**.

Hence, it is not necessary to provide a separate space for retracting the LED units **16** thereinto. The LED units **16** can be moved to the space formed by removing the sheet supply tray **8** from the main casing **2** so as to be moved away from the corresponding photosensitive drums **20**.

Consequently, the color printer **1** can be made more compact, thereby saving a space for placing the color printer **1**.

(2) Further, in the color printer **1** according to the first embodiment of the present invention, as shown in FIGS. **3** and **4**, the main casing **2** is provided with the pair of right and left interlocking mechanisms **61**. The pair of interlocking mechanisms **61** is adapted to move each LED unit **16** to the retracted position from the adjacent position in response to the movement of the front cover **7** to the open position from the closed position and also to move each LED unit **16** to the adjacent position from the retracted position in response to the movement of the front cover **7** to the closed position from the open position.

Hence, by moving the front cover **7** to the open position, each LED unit **16** can be reliably moved away from the corresponding photosensitive drum **20**.

As a result, interference of the LED units **16** with the process unit **15** when the process unit **15** is moved relative to the main casing **2** can be reliably prevented.

Further, by moving the front cover **7** to the closed position, each LED unit **16** can be reliably moved to the adjacent position.

(3) Further, in the color printer **1** according to the first embodiment of the present invention, as shown in FIG. **1**, the sheet supply tray **8** interferes with the front cover **7** to restrict the movement of the front cover **7** to the open position when the sheet supply tray **8** is mounted in the main casing **2**.

This structure can prevent each LED unit **16** from being moved to the retracted position while the sheet supply tray **8** is mounted in the main casing **2**.

Consequently, interference of the sheet supply tray **8** with the LED units **16** can be prevented.

(4) Further, in the color printer **1** according to the first embodiment of the present invention, as shown in FIG. **1**, when the process unit **15** is in the mounted position, the pickup roller **10** is arranged to overlap with the process unit **15** in the frontward/rearward direction.

More specifically, the pickup roller **10** disposed above the sheet supply tray **8** is disposed rearward of the process unit **15**.

Therefore, the process unit **15** and the sheet supply tray **8** can be disposed adjacent to each other in the vertical direction. As a result, the color printer **1** can be downsized in the vertical direction.

9. Second Embodiment

A color printer **111** as an image forming device according to a second embodiment of the present invention will be described while referring to FIGS. **8** to **13**.

In the following description, parts and components appearing in the second embodiment and the same as those in the first embodiment will be designated by the same reference numerals as those in the first embodiment to avoid duplicating description, and only parts and components differing from those of the above-described first embodiment will be described.

In the above-described first embodiment, the process unit **15** retains the four photosensitive drums **20**, the four Scorotron chargers **21**, and the four developing units **22**. Further, the four LED units **16** are moved to the space formed by removing the sheet supply tray **8** from the main casing **2**, thereby moving each LED unit **16** to the retracted position.

On the other hand, in the second embodiment, as shown in FIG. **8**, the color printer **111** includes a process unit **115** that has a drum drawer **121** and a developing drawer **122**. The drum drawer **121** retains the four photosensitive drums **20** and the four Scorotron chargers **21**. The developing drawer **122** retains the four developing units **22** and four LED units **127**.

As shown in FIG. **11**, the developing drawer **122** is moved to a space formed by removing the sheet supply tray **8** from the main casing **2**, thereby moving the developing drawer **122** to a retracted position.

(1) Process Unit

(1-1) Drum Drawer

As shown in FIG. **8**, the drum drawer **121** includes a drum drawer frame **125**. The drum drawer frame **125** is formed in a rectangular frame shape having top and bottom openings. Within the drum drawer frame **125**, the four photosensitive drums **20** and the four Scorotron chargers **21** are integrally retained.

The four photosensitive drums **20** are juxtaposedly arranged with each other at regular intervals in the frontward/rearward direction. More specifically, a black photosensitive drum **20**K, a yellow photosensitive drum **20**Y, a magenta photosensitive drum **20**M, and a cyan photosensitive drum **20**C are aligned in this order from front to rear.

Each Scorotron charger **21** is disposed diagonally below and rearward of the corresponding photosensitive drum **20**, and confronts but does not contact the corresponding photosensitive drum **20**, in the same manner as the first embodiment.

The drum drawer **121** is provided with the belt cleaning roller **95** at a position frontward of the black photosensitive drum **20**K.

The belt cleaning roller **95** is rotatably supported to the drum drawer frame **125** so as to contact the lower portion of the intermediate transfer belt **30** from below.

The drum drawer frame **125** has right and left side walls, each provided with the front roller **84** and the set of two rear rollers **85**. The front roller **84** provided in the right side wall is rotatably provided in a front portion of the right side wall and protrudes outward (rightward) in the rightward/leftward direction from the right side wall. Likewise, the front roller **84** disposed at the left side wall is rotatably provided in a front portion of the left side wall and protrudes outward (leftward) in the rightward/leftward direction from the left side wall.

Further, the set of two rear rollers **85** disposed at the right side wall is rotatably provided in a rear portion of the right side wall and protrudes outward (rightward) from the right side wall in the rightward/leftward direction. The set of two rear rollers **85** disposed at the left side wall is rotatably provided in a rear portion of the left side wall and protrudes outward (leftward) from the left side wall in the rightward/leftward direction.

(1-2) Developing Drawer

The developing drawer **122** includes a developing drawer frame **126**. The developing drawer frame **126** is formed in a rectangular frame shape having a bottom wall and a top open. Within the developing drawer frame **126**, the four developing units **22** and the four LED units **127** are integrally retained.

The developing drawer **122** is supported in a developing drawer supporting section **124** (described later) of the inner casing **42** and movable between a retracted position (FIG. **11**) and an adjacent position (FIG. **8**). In the retracted position, the developing drawer **122** is retracted downward so as to be moved away from the four photosensitive drums **20**. In the adjacent position, the developing drawer **122** is located adjacent to the four photosensitive drums **20** so that the four developing rollers **23** are brought into contact with the corresponding photosensitive drums **20** from below. Further, the developing drawer **122** is arranged to overlap with the pickup roller **10** in the frontward/rearward direction when the developing drawer **122** is in the adjacent position.

Each developing unit **22** is disposed diagonally below and frontward of the corresponding photosensitive drum **20**, in the same manner as the first embodiment. The four developing units **22** are juxtaposedly arranged with each other at regular intervals in the frontward/rearward direction. More specifically, a black developing unit **22**K, a yellow developing unit **22**Y, a magenta developing unit **22**M, and a cyan developing unit **22**C are aligned in this order from front to rear. Further, each developing unit **22** is detachable and mountable relative to the developing drawer frame **126** in the vertical direction while guided by guide recesses (not shown) formed in the developing drawer frame **126**.

The black developing unit **22**K is integrally provided with the waste toner retaining section **94**, the scraping roller **96**, and the scraping blade **98** at a position frontward of the black developing unit **22**K.

The waste toner retaining section **94** is formed in a generally box-shape having the top opening **97**.

The scraping roller **96** is arranged in confrontation with the opening **97** formed in the waste toner retaining section **94** at a position above the opening **97**. Further, the scraping roller **96** contacts the belt cleaning roller **95** of the drum drawer **121** from below.

The scraping blade **98** is formed in a generally plate shape extending in the frontward/rearward direction. The scraping blade **98** has a front end (base end) that is fixed to the waste toner retaining section **94** at a front periphery of the opening **97** and a rear end (free end) that contacts the scraping roller **96** from below.

The waste toner retaining section **94**, the scraping roller **96**, the scraping blade **98** and the belt cleaning roller **95** constitute the belt cleaning unit **93**.

The belt cleaning unit **93** functions to clean waste toner deposited on the surface of the intermediate transfer belt **30** by the belt cleaning roller **95**. After the waste toner carried on the belt cleaning roller **95** is supplied to the scraping roller **96**, the waste toner carried on the scraping roller **96** is scraped off with the scraping blade **98**. Hence the waste toner is collected in the waste toner retaining section **94**.

Each LED unit **127** has a configuration similar to the LED unit **16** according to the first embodiment except that the LED unit **127** is provided with a support beam **128** in place of the support shaft **106** and is not provided with the support arm **101**. Each LED unit **127** is fixed to the developing drawer frame **126** of the developing drawer **122** at a position rearward of the corresponding developing unit **22**. The support beam **128** is formed in a generally quadrangular prism shape.

More specifically, each LED unit **127** includes the LED array **102** and the LED array support member **104** provided with the support beam **128**. Each LED unit **127** is fixed to the developing drawer frame **126** of the developing drawer **122** at right and left ends of the support beam **128** of the LED array support member **104** so that the LED array **102** exposes the corresponding photosensitive drum **20** from below.

The developing drawer frame **126** has right and left side walls, each provided with a front roller **841** and a pair of rear rollers **851**. The front roller **841** disposed at the right side wall is provided in a front portion of the right side wall and protrudes outward (rightward) in the rightward/leftward direction from the right side wall. The front roller **841** disposed at the left side wall is rotatably provided in a front portion of the left side wall and protrudes outward (leftward) in the rightward/leftward direction from the left side wall.

Further, the pair of two rear rollers **851** disposed at the right side wall is rotatably provided in a rear portion of the right side wall and protrudes outward (rightward) in the rightward/leftward direction from the right side wall. The pair of two rear rollers **851** disposed at the left side is rotatably provided in a rear portion of the left side wall and protrudes outward (leftward) in the rightward/leftward direction from the left side wall.

(2) Main Casing

As shown in FIG. **9**, the inner casing **42** of the main casing **2** includes a drum drawer supporting section **123** for supporting the drum drawer **121** and the developing drawer supporting section **124** for supporting the developing drawer **122** at positions below the belt accommodating section **44**.

(2-1) Drum Drawer Supporting Section

The drum drawer supporting section **123** has a configuration similar to the process unit supporting section **45** according to the first embodiment.

More specifically, the drum drawer supporting section **123** is disposed immediately below the belt accommodating section **44** at a substantially vertical center of the inner casing **42**. Further, the drum drawer supporting section **123** has a right and left side walls, each formed with the first guide groove **52** for guiding a rear portion of the drum drawer **121** (the rear rollers **85**) and the second guide groove **54** for guiding a front portion of the drum drawer **121** (the front roller **84**).

(2-2) Developing Drawer Supporting Section

The developing drawer supporting section **124** is disposed immediately below the drum drawer supporting section **123** at the lower portion of the inner casing **42**. Within the devel-

oping drawer supporting section **124**, a pair of right and left interlocking mechanisms **131** is provided. The pair of right and left interlocking mechanisms **131** is adapted to move the developing drawer **122** in interlocking relation to the movement of the front cover **7**. Further, the developing drawer supporting section **124** has right and left side walls, each formed with a pair of front and rear support member guide grooves **134** for guiding a support member **132** of the interlocking mechanism **131**.

Each of the right and left interlocking mechanisms **131** includes the support member **132** for slidably supporting the developing drawer **122** in the frontward/rearward direction and a connection member **133** for connecting the support member **132** to the front cover **7**.

The support member **132** is formed in a generally flat plate shape and elongated in the frontward/rearward direction. The support member **132** has a length in the frontward/rearward direction greater than that of the developing drawer **122**. The support member **132** is formed with a third guide groove **130** for guiding the front roller **841** and the pair of rear rollers **851** of the developing drawer **122**. Further, the support member **132** is provided with a pair of front and rear guide bosses **135** inserted into the pair of front and rear support member guide grooves **134**.

The third guide groove **130** has a height (vertical length) allowing the front roller **841** and the rear roller **851** to be retained therein. The third guide groove **130** is formed in the support member **132** across the entire length in the frontward/rearward direction and extends linearly in the frontward/rearward direction.

Each guide boss **135** is formed in a generally cylindrical shape. The pair of front and rear guide bosses **135** of each support member **132** protrudes outward (rightward or leftward) from an outer surface of the right support member **132** in the rightward/leftward direction. The front guide boss **135** of each support member **132** is disposed at a front end portion of the support member **132** and the rear guide boss **135** of each support member **132** is disposed at a rear end portion of the support member **132**.

The connection member **133** has a configuration similar to the second connection member **63** according to the first embodiment. More specifically, the connection member **133** is formed in a generally lever shape and elongated in the frontward/rearward direction. The connection member **133** has a front end portion that is swingably connected to the front cover **7**. Further, the connection member **133** has a rear end portion formed with the connection hole **67** to which the front guide boss **135** of the support member **132** is connected (inserted).

Each of the front and rear support member guide grooves **134** formed in each right side wall of the developing drawer supporting section **124** is depressed outward (rightward or leftward) from an inner surface of each side wall in the rightward/leftward direction. Further, each support member guide groove **134** is formed in a generally crank-shape (S-shape) in a side view extending diagonally below and frontward from an upper rear side. Each support member guide groove **134** has a width allowing the corresponding guide boss **135** of the support member **132** to be inserted thereinto.

Each support member guide groove **134** has a vertical length greater than a protruding length of each developing unit **22**. The protruding length of the developing unit **22** represents a length of part of the developing unit **22** that protrudes upward from the developing drawer frame **126** to the drum drawer frame **125**. Further, each support member guide groove **134** has a top edge that is positioned below the drum drawer **121** (FIG. **12**) and a bottom edge that is positioned immediate above the sheet supply tray **8** (FIG. **8**) when projected in the rightward/leftward direction. Further, the top edge of each rear support member guide groove **134** is arranged to overlap with the pickup roller **10** when projected in the rightward/leftward direction.

The front guide boss **135** of the support member **132** is inserted into the front support member guide groove **134** formed in the side wall of the developing drawer supporting section **124** through the connection hole **67** formed in the connection member **133**. The rear guide boss **135** of the support member **132** is also inserted into the rear support member guide groove **134** formed in the side wall of the developing drawer supporting section **124**. The support member **132** is thus connected to the front cover **7** through the connection member **133** and also supported to the side wall of the developing drawer supporting section **124**.

When the front cover **7** is in the closed position, each support member **132** is positioned at a first position (FIG. **9**) in which the corresponding front and rear guide bosses **135** are respectively positioned at upper rear end portions of the corresponding front and rear support member guide grooves **134**.

Further, when the front cover **7** is moved to the open position from the closed position, each support member **132** is pulled diagonally below and frontward by the corresponding connection member **133** and moved diagonally below and frontward while each pair of front and rear guide bosses **135** is guided by the corresponding pair of front and rear support member guide grooves **134**.

Further, when the front cover **7** reaches the open position, each support member **132** is positioned at a second position (FIG. **10**) in which the corresponding front and rear guide bosses **135** are respectively positioned at lower front end portions of the corresponding front and rear support member guide grooves **134**.

When the front cover **7** is moved to the closed position from the open position, each support member **132** is pushed diagonally above and rearward by the corresponding connection member **133** and moved diagonally above and rearward while each pair of front and rear guide bosses **135** is guided by the corresponding pair of front and rear support member guide grooves **134**. As a result, each support member **132** is moved to the first position from the second position.

(3) Interlocking Movement of Front Cover and Developing Drawer

As shown in FIGS. **11** and **12**, the developing drawer **122** is slidingly movably supported to the right and left support members **132**, by rotatably inserting the front rollers **841** and the pair of rear rollers **851** into the third guide grooves **130**.

As shown in FIGS. **8** and **9**, when the front cover **7** is in the closed position and each support member **132** is in the first position, the developing drawer **122** is in the adjacent position.

At this time, each developing roller **23** is positioned diagonally below and frontward of the photosensitive drum **20**, and contacts the corresponding photosensitive drum **20**. Further, the right and left LED positioning members **105** of each LED unit **127** contact the photosensitive drum **20** from below. Accordingly, the LED array **102** of each LED unit **127** is arranged in confrontation with the corresponding photosensitive drum **20** at a prescribed distance so that the LED array **102** can expose the corresponding photosensitive drum **20**.

As shown in FIGS. **10** and **11**, when the front cover **7** is moved to the open position from the closed position, each support member **132** is moved to the second position from the first position. Hence, the developing drawer **122** is moved to the retracted position.

At this time, each developing unit **22** and each LED unit **127** are retracted downward from the drum drawer **121** such that the developing unit **22** and the LED units **127** do not interfere with the drum drawer **121** in the rightward/leftward direction when the drum drawer **121** is mounted in or removed from the main casing **2** (FIG. **11**).

When the front cover **7** is moved to the closed position from the open position, in conjunction with the movement of each support member **132** to the first position from the second position, the developing drawer **122** is moved to the adjacent position. At this time, a rear wall of the developing drawer **122** is brought into contact with a stopper **120** disposed frontward of the pickup roller **10**, thereby positioning the developing drawer **122** with respect to the main casing **2** (FIG. **8**).

(4) Removal and Mounting of Drum Drawer and Developing Unit **22**

To remove the drum drawer **121** and the developing unit **22** from the main casing **2** or to mount the drum drawer **121** and the developing unit **22** in the main casing **2**, initially, the sheet supply tray **8** is pulled frontward to be removed from the main casing **2**. Then, the front cover **7** is moved to the open position from the closed position to open the opening **6**.

Then, as described above, in response to the movement of the front cover **7** to the open position from the closed position, the developing drawer **122** is moved to the retracted position so as to be retracted into the space formed by removing the sheet supply tray **8** from the main casing **2**.

Then, to remove the drum drawer **121** from the main casing **2**, as shown in FIG. **13**, the drum drawer **121** is pulled frontward from the main casing **2** through the opening **6**.

Then, each rearmost roller **85** of the drum drawer **121** is separated from the corresponding leaf spring **53** at the rear portion of the corresponding first guide groove **52**. Each front roller **84** of the drum drawer **121** is also separated from the corresponding leaf spring **55** at the rear portion of the corresponding second guide groove **54**. As a result, the drum drawer **121** is moved downward so that each photosensitive drum **20** is separated from the lower portion of the intermediate transfer belt **30**.

Subsequently, when drum drawer **121** is further pulled frontward, the drum drawer **121** is guided by the first guide grooves **52** and the second guide grooves **54**, and pulled outward from the main casing **2** while maintaining a slight gap between the lower portion of the intermediate transfer belt **30** and the drum drawer **121**. Hence, the drum drawer **121** is removed from the main casing **2**. At this time, since the developing drawer **122** is in the retracted position, the developing drawer **122** does not interfere with the movement of the drum drawer **121** in the rightward/leftward direction.

To remove the developing unit **22** from the main casing **2** or to mount the developing unit **22** in the main casing **2**, as shown in FIG. **12**, the developing drawer **122** is pulled frontward from the main casing **2** through the opening **6**.

Then, the developing unit **22** is removed from or mounted in the developing drawer **122** pulled outward from the main casing **2**. More specifically, to remove the developing unit **22** from the developing drawer **122**, the developing unit **22** is pulled upward. To mount the developing unit **22** in the developing drawer **122**, the developing unit **22** is positioned at a prescribed position to be inserted into the developing drawer frame **126** of the developing drawer **122** from above.

By performing, in reverse order, the above-described operation for removing the drum drawer **121** and the developing drawer **122** from the main casing **2**, the drum drawer **121** and the developing drawer **122** are mounted in the main casing **2**.

More specifically, to mount the drum drawer **121** in the main casing **2**, the drum drawer **121** is inserted into the main casing **2** along the first guide grooves **52** and the second guide grooves **54**.

At this time, the drum drawer **121** is guided by the first guide grooves **52** and the second guide grooves **54** to be inserted into the main casing **2** while maintaining a slight gap between the lower portion of the intermediate transfer belt **30** and the drum drawer **121**.

Then, each rearmost roller **85** of the drum drawer **121** rides up over the corresponding leaf spring **53** at the rear portion of the corresponding first guide groove **52**. Each front roller **84** of the drum drawer **121** also rides up over the corresponding leaf spring **55** at the rear portion of the corresponding second guide groove **54**. The drum drawer **121** is thus moved upward so that each photosensitive drum **20** is brought into contact with the lower portion of the intermediate transfer belt **30**.

As a result, the drum drawer **121** is mounted in the main casing **2** so as to be constantly biased upward by the biasing forces of the leaf springs **53** and the leaf springs **55**.

Further, to mount the developing drawer **122** in the main casing **2**, the developing drawer **122** is initially inserted into the main casing **2** along the third guide grooves **130** of the support members **132**. Then, the front cover **7** is moved to the closed position from the open position, so that the developing drawer **122** is moved to the adjacent position as described above.

Then, after the front cover **7** is moved to the closed position, the sheet supply tray **8** is mounted in the main casing **2** through the opening **43** of the front cover **7**.

(5) Operations and Effects of Second Embodiment

In the color printer **111** according to the second embodiment, operations and effects similar to those of the first embodiment can also be obtained.

As shown in FIG. **8**, the color printer **111** according to the second embodiment includes the developing drawer **122**. The developing drawer **122** retains the four developing units **22** and the four LED units **127** therein. The developing drawer **122** is movable between the adjacent position located adjacent to the four photosensitive drums **20** and the retracted position retracted from the four photosensitive drums **20**.

Hence, the developing unit **22** whose replacement frequency is higher can be replaced with a new one separately from replacement of the photosensitive drum **20**. Therefore, replacement of each developing unit **22** can be efficiently conducted.

Further, as shown in FIG. **8**, the color printer **111** according to the second embodiment includes the belt cleaning unit **93** for cleaning the intermediate transfer belt **30**. The belt cleaning unit **93** is arranged in confrontation with the intermediate transfer belt **30** in a direction the same as a direction that each photosensitive drum **20** confronts the intermediate transfer belt **30**. That is, the belt cleaning unit **93** is arranged in confrontation with the intermediate transfer belt **30** from below.

Compared with a case where the belt cleaning unit **93** is arranged in confrontation with the intermediate transfer belt **30** in a direction opposite to the direction that each photosensitive drum **20** confronts the intermediate transfer belt **30** (i.e. the belt cleaning unit **93** is arranged in confrontation with the intermediate transfer belt **30** from above), the color printer **111** can be downsized in the vertical direction (i.e. the direction that each photosensitive drum **20** confronts the intermediate transfer belt **30**).

Further, in the color printer **111** according to the second embodiment, the waste toner retaining section **94** for accommodating the waste toner is provided in the developing drawer **122**.

Hence, replacement of the waste toner retaining section **94** can be efficiently conducted together with the developing drawer **122** whose replacement frequency is higher.

While the present invention has been described in detail with reference to the present embodiments thereof, it would be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the present invention.

What is claimed is:

**1**. An image forming device comprising:

a main casing;

a retaining member configured to retain a plurality of cartridges juxtaposedly arrayed in a prescribed direction, each of the plurality of cartridges including a photosensitive drum, the retaining member being configured to move in the prescribed direction between a mounted position in which the retaining member is mounted in the main casing and a pulled-out position in which the retaining member is pulled out of the main casing;

a belt disposed above a plurality of photosensitive drums corresponding to the plurality of cartridges when the retaining member is in the mounted position;

a plurality of exposure units disposed below the belt and configured to move between an adjacent position which is positioned below the belt and in which each of the plurality of exposure units is located adjacent to the corresponding photosensitive drum to expose thereof, and a retracted position, which is positioned below the belt and in which each of the plurality of exposure units is moved away from the corresponding photosensitive drum; and

a tray disposed below the retaining member when the retaining member is in the mounted position.

**2**. The image forming device according to claim **1**, wherein the main casing has a plurality of guide grooves, each of the guide grooves being configured to guide the corresponding exposure unit to move between the adjacent position and the retracted position, and

wherein the guide groove is arranged relative to a pickup roller such that light image of the pickup roller partially overlap with the guide groove when projected in the prescribed direction.

**3**. The image forming device according to claim **1**, wherein the main casing has an opening through which the retaining member is moved between the mounted position and the pulled-out position,

wherein the main casing comprises:

a cover configured to move between an open position opening the opening and a closed position closing the opening; and

an interlocking mechanism that moves each of the plurality of exposure units from the adjacent position to the retracted position in conjunction with a movement of the cover from the closed position to the open position, and moves each of the plurality of exposure units from the refracted position to the adjacent position in conjunction with a movement of the cover from the open position to the closed position.

**4**. The image forming device according to claim **3**, wherein the tray restricts a movement of the cover to the open position by interfering with the cover when the tray is inserted into the main casing.

**5**. The image forming device according to claim **1**, further comprising a cleaning unit arranged in confrontation with the belt in a direction equivalent to a direction in which each of the plurality of photosensitive drums confronts the belt and configured to clean the belt.

**6**. The image forming device according to claim **1**, further comprising a secondary transfer roller that contacts the belt.

**7**. The image forming device according to claim **1**, further comprising a pickup roller configured to pick up a medium accommodated in the tray, a part of the pickup roller being arranged to overlap with a part of the retaining member in the prescribed direction when the retaining member is in the mounted position.

**8**. An image forming device comprising:

a main casing;

a first drawer configured to retain a plurality of photosensitive drums juxtaposedly arrayed in a prescribed direction, the first drawer being configured to move in the prescribed direction between a first mounted position in which the first drawer is mounted in the main casing and a first pulled-out position in which the first drawer is pulled out of the main casing;

a second drawer configured to retain a plurality of developing cartridges juxtaposedly arrayed in the prescribed direction, each of the plurality of developing cartridges including a developing roller, the second drawer being configured to move in the prescribed direction between a second mounted position in which the second drawer is mounted in the main casing and a second pulled-out position in which the second drawer is pulled out of the main casing;

a belt disposed above the first drawer to oppose each of the plurality of photosensitive drums when the first drawer is in the first mounted position;

a tray disposed below the second drawer when the second drawer is in the second mounted position; and

a pickup roller configured to pick up a medium accommodated in the tray, a part of the pickup roller being arranged to overlap with a part of the second drawer in the prescribed direction when the second drawer is in the second mounted position.

**9**. The image forming device according to claim **8**, further comprising a plurality of exposure units disposed below the belt and configured to move between an adjacent position in which each of the plurality of exposure units is located adjacent to the corresponding photosensitive drum to expose thereof and a retracted position in which each of the plurality of exposure units is moved away from the corresponding photosensitive drum.

**10**. The image forming device according to claim **9**, wherein the pickup roller is arranged relative to each of the plurality of exposure units such that light image of the pickup roller partially overlap with a movement locus of each of the plurality of exposure units between the adjacent position and the retracted position when projected in the prescribed direction.

**11**. The image forming device according to claim **9**, wherein the main casing has an opening through which the first drawer is moved between the first mounted position and the first pulled-out position, wherein the main casing comprises:

a cover configured to move between an open position opening the opening and a closed position closing the opening; and

an interlocking mechanism that moves each of the plurality of exposure units from the adjacent position to the retracted position in conjunction with a movement of the

cover from the closed position to the open position, and moves each of the plurality of exposure units from the retracted position to the adjacent position in conjunction with a movement of the cover from the open position to the closed position.

**12**. The image forming device according to claim **11**, wherein the tray restricts a movement of the cover to the open position by interfering with the cover when the tray is inserted into the main casing.

**13**. The image forming device according to claim **8**, further comprising a cleaning unit arranged in confrontation with the belt in a direction equivalent to a direction in which each of the plurality of photosensitive drums confronts the belt and configured to clean the belt.

**14**. The image forming device according to claim **13**, wherein the cleaning unit comprises a waste developer retaining portion for accommodating a waste developer, the waste developer retaining portion being provided on the second drawer.

**15**. The image forming device according to claim **8**, further comprising a secondary transfer roller that contacts the belt.

**16**. An image forming device comprising:

a main casing;

a first drawer configured to retain a plurality of photosensitive drums juxtaposedly arrayed in a prescribed direction, the first drawer being configured to move in the prescribed direction between a first mounted position in which the first drawer is mounted in the main casing and a first pulled-out position in which the first drawer is pulled out of the main casing;

a second drawer configured to retain a plurality of developing cartridges juxtaposedly arrayed in the prescribed direction, each of the plurality of developing cartridges including a developing roller, the second drawer being configured to move in the prescribed direction between a second mounted position in which the second drawer is mounted in the main casing and a second pulled-out position in which the second drawer is pulled out of the main casing;

a belt disposed above the first drawer to oppose each of the plurality of photosensitive drums when the first drawer is in the first mounted position;

a plurality of exposure units disposed below the belt and configured to move between an adjacent position, which is positioned below the belt and in which each of the plurality of exposure units is located adjacent to the corresponding photosensitive drum to expose thereof, and a retracted position, which is positioned below the belt and in which each of the plurality of exposure units is moved away from the corresponding photosensitive drum; and

a tray disposed below the second drawer when the second drawer is in the second mounted position.

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